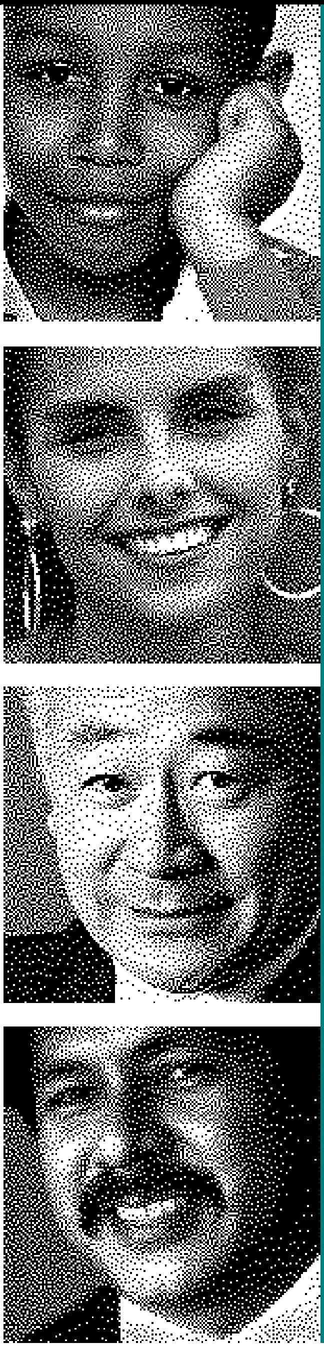
Packard Bell™

486

Personal Computer



User's Manual

For SX, SX2, DX and DX2 systems.

A complete introduction to your new computer system.

Includes Getting Started information and much more.

INFORMATION TO USER OF CLASS B COMPUTER DEVICE

FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT

WARNING! This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Part 15 of the FCC Rules. Only peripherals (computer input/ output devices, terminals, printers, etc.) certified to comply with the FCC Class B limits may be attached to this equipment. Operation with non certified peripherals is likely to result in interference to radio and TV reception.

REMARKS To meet FCC requirements shielded cables and power cords are required to connect the device to a personal computer or other Class B certified device.

INTRUCTIONS TO USER Note: This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception which can be determined by turning the equipment off and on the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.
- If necessary, consult your dealer's service representative for additional suggestions.

The user may find the booklet, How to Identify and Resolve Radio-TV Interference Problems, prepared by the Federal Communications Commission helpful. This booklet is available from the U.S. Government Printing Office, Washington DC 20402, Stock No. 004-000-00345-4.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment.

The use of non-shielded interface cable is prohibited.

The user should note that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

PB450 rev. 2 (7/6/95)
Nº 100833

Canadian Department Of Communications Radio Frequency Interference Statement

English This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communication.

Français Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B préscrites dans le Règlement sur le brouillage radioélectrique édicte par le Ministere des Communications du Canada.

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Packard Bell is a trademark of Packard Bell Electronics, Inc.

Warranty

Packard Bell warrants this product against defects in material and workmanship for a period of one (1) year, commencing on the date of original purchase. Packard Bell products are manufactured from new and serviceable used parts tested to Packard Bell's quality assurance standards. Please refer to your system warranty card for details of the Packard Bell Warranty.

Safety And Maintenance Precautions

1. Read all of these instructions.

2. Save these instructions for future use.

3. Follow all warnings and instructions marked on the products.

4. Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.

5. Do not use this product near water.

6. Do not place this product on an unstable surface. If the product should fall, it may become seriously damaged and, more importantly, may cause injuries to the user.

7. Slots and openings in the cabinet are provided for ventilation to ensure reliable operation of the product and to protect it from overheating. These openings should never be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surfaces. This product should never be placed near or over any object which produces heat. This product should not be placed in a built-in installation unless proper ventilation is provided.

8. This product should be operated from the type of power source indicated on the label. If you are not sure of the type of power available, consult your dealer or local power company.

9. This product is equipped with a polarized alternating-current (three-pronged) line plug. This plug will fit into the power outlet in only one way. This is a safety feature. If you can't insert the plug into your AC outlet, contact an electrician to replace your outlet with one that accepts a grounded (three-pronged) plug. Do not try to force it and defeat the purpose of the grounding-type plug. Do not remove the grounding pin from the plug.

10. Do not allow anything to rest on the power cord. Do not put this product where the cord could be stepped on.

11. If an extension cord is used with this product, make sure that the sum of the ampere ratings of all the products plugged into the extension cord does not exceed the extension cord's ampere rating. Also, make sure that total amperage of all the products plugged into any one outlet at any one time does not exceed 15 amperes.

12. The AC input supplies power to the system unit. The power cord supplied with your computer is for 115V power; to use your computer with 230V power, you must purchase an appropriate power cord.

13. Never push objects of any kind into this product through cabinet slots, as they may touch dangerous voltage points or cause short circuits, risking the possibility of a fire or electric shock. Never spill liquid of any kind onto the product.

14. Do not attempt to service this product yourself. If you have the slightest suspicion that the product is not in proper working order, unplug the unit and seek assistance from qualified service personnel, especially under the following conditions:

    A. When the power cord or plug is damaged or frayed.

    B. If liquid has been spilled onto the product, or if the product has been exposed to rain or water.

    C. If the product has been dropped or the cabinet has been damaged.

    D. If the product exhibits a distinct deterioration in performance, indicating a need for service.

If the product does not operate normally when the operating instructions are followed, adjust only those controls that are covered by the operating instructions, since improper adjustment of other controls may result in further damage or complications.

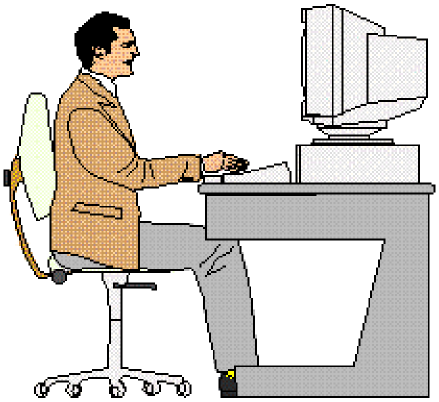
Replacing CMOS RAM Battery

Your systems **Real Time Clock CMOS RAM Battery** is located at **BT1** (near the riser card connector) on your systems motherboard (see **Fig. D-1 in Appendix D**). If your systems CMOS settings (for example, date and time) ever fail, the battery may need to be replaced. Contact Packard Bell Customer Service for assistance.

WARNING! *To avoid possible injury due to incorrect replacement, replace the battery with the same or equivalent type. Discard used batteries as required by local ordinance, or as normal waste if no local ordinance exists. Do not expose the battery to fire or excessive heat. Keep the battery away from children.*

Getting More From Your Packard Bell System

Whether you write memos, build spreadsheets, use the "information superhighway" or play games, your new Packard Bell system will become an important part of your life. To use your computer more effectively, you should have a work environment where you can work comfortably for long periods.



Packard Bell has created this guide, with tips on how to use your computer safely and comfortably, and suggestions that you can use to help make your computing experience more pleasurable.

Create a Comfortable Work Area

If you work in your home, then you have a lot of control over your work area, including the location, lighting, furniture, and so on. If you're in an office, you probably have an assigned work area with fewer options. Either way, there are many things you can do to maintain a comfortable place to work. Consider the following suggestions when setting up your work area:

Lighting

Be sure your work place is well-lit. If the lighting in your office isn't bright enough, use a desk lamp to provide light where you need it. Avoid bright or reflected light sources in your field of vision.

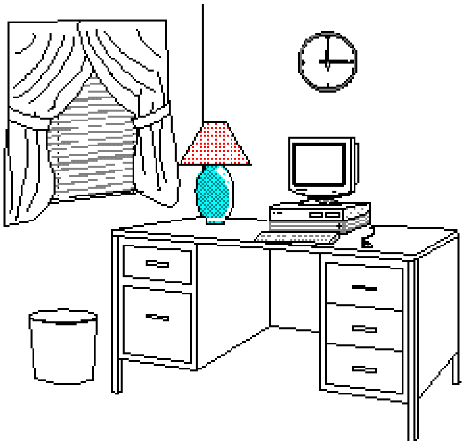


Figure 1: Select a comfortable area with the right lighting

Desk

The ideal computer desk should place the keyboard between 23 and 28.5 inches from the floor, depending on your height and preference. (Generally, your arms should be at right angles to the keyboard when you sit in front of it with your fingers on the spacebar.) If your desk is taller than this, you can lower the keyboard to a comfortable level by adding a keyboard drawer. (See **Figure 6**.)

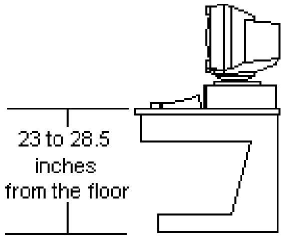


Figure 2: Keyboard Placement and Desk

Your desk should also be deep enough to let you place the monitor a comfortable distance from your eyes -- about 18 to 28 inches. A desk that's too shallow will force you to sit uncomfortably close to the screen. (See **Figure 4**.)

Your Chair

Your chair should adjust up and down, backward and forward, for maximum comfort. Your knees and hips should be at right angles to your chair's seat, with your thighs parallel to the floor, and both feet flat on the floor.

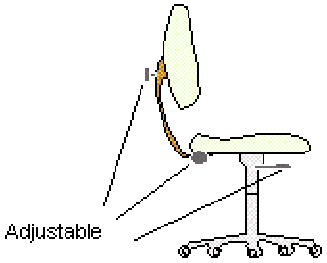


Figure 3: Adjustable Chair

Placing the Components

Make sure your computer system has been set up for maximum comfort. (See **Chapter 2: Quick Start** or **Chapter 3: Setting Up** for complete system setup instructions.) Figure 4 illustrates an example of a typical desktop system setup and proper seating position.

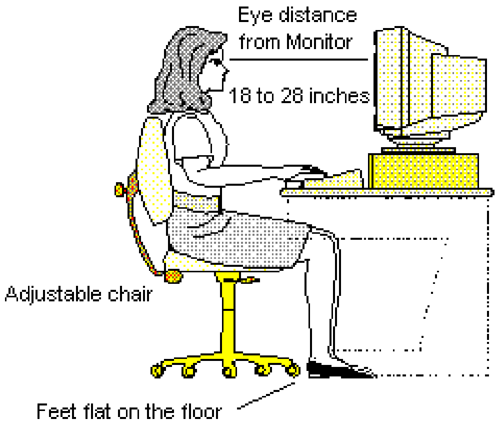


Figure 4: Ideal seating position

Computer When placing a **desktop computer** on your desk, remember that you can place your monitor on top of it, as long as this doesn't raise the monitor above your eye level. If it does, place the computer elsewhere on your desk. If you have a **minitower system**, you may want to place it on the floor next to your desk to maximize desktop workspace. *Make sure that the system's location gives you enough room to connect the various cables to your system without straining them.*

Wherever you place the computer, make sure that the diskette and/or CD-ROM drives are within easy reach. You shouldn't have to bend or stretch to reach them. Your work materials should also be within easy reach.

Monitor The monitor should be about 18 to 28 inches from your eyes, and the top of your screen should be at eye level, or lower.

Once you have your work area arranged, make sure your monitor doesn't reflect glare from windows or lights. If your monitor has a tilt/swivel base, you can tilt the monitor slightly downward to minimize reflected light. If you cannot adjust your monitor's angle or the lighting in your work area, try adding an **anti-glare screen** to your monitor. Contact your Packard Bell dealer for further information.

Using Your Computer Comfortably

Once your work area and computer are set up, you're ready to use your system. As you work, follow these guidelines for maximum comfort:

Posture Sit with your back relaxed, and your hips and knees at an approximate 90-degree angle to your chair's seat. If necessary, adjust your chair so that your thighs are roughly parallel to the floor, and your feet are flat on the floor. (See **Figure 4**.)

Typing As you type, allow your hands to "float" over the keyboard. Don't bend your wrists as you type.

Using the Mouse Move your entire arm instead of bending your wrist. Be sure the mouse is positioned to allow easy movement.

Take a Break If you work for hours at a time, take regular rest breaks. Get up from your chair, stretch, and limber up your wrists with simple exercise.

If possible, vary your tasks during the day so that you don't sit in one position for several hours.

Screen Resolution

Many VGA display systems can be configured to use different resolutions, with 640 x 480, 800 x 600 and 1024 x 768 being the most common. While higher resolutions offer more information on a given screen, they also reduce the size of the image, making on-screen text harder to see from a comfortable distance.

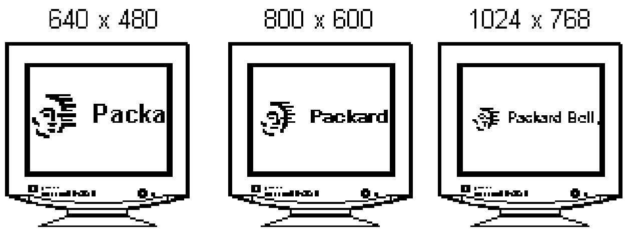


Figure 5: Simulated views showing different screen resolutions

Which resolution is right for you? That depends on the kind of work you do with your computer. If your work involves **word processing, spreadsheets, data entry**, and other "text-heavy" tasks, you may want to use a resolution such as 640 x 480.
While higher resolutions are recommended if you use software for **drawing, painting, desktop publishing**, or **computer aided design (CAD),** the ideal resolution really depends on what works best for you.

Useful Accessories

Here are some accessories that can help you work more comfortably. Look for them where you shop for computers, software, or office supplies:

Keyboard Drawer If your desktop is too high to allow comfortable typing, a keyboard drawer can help, by letting you slide your keyboard under the desk at a lower level. Many drawers are wide enough to hold both your keyboard and mouse.

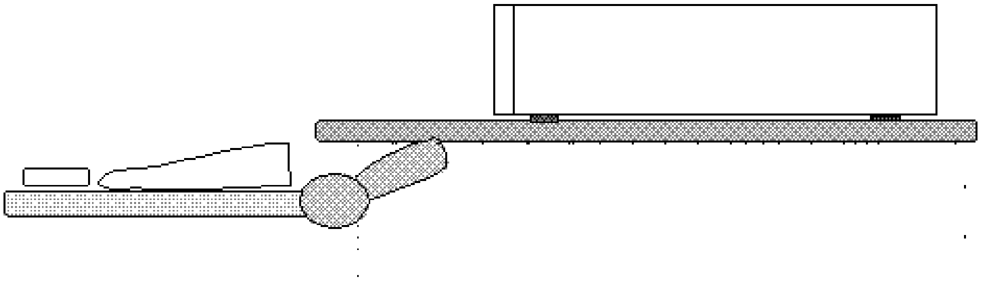


Figure 6: Computer desk with keyboard underneath

Wrist Rest These padded strips sit in front of your keyboard and mouse pad, and support your wrist and arm.

Mouse Pad If you're using a mouse on your desktop instead of in a keyboard drawer, place a mouse pad under your mouse. The pad provides the proper surface necessary to use your mouse effectively.

1

Introduction

Thank you for purchasing a new Packard Bell 486 computer! Your Packard Bell system offers the power, speed and multitasking capabilities of the Intel®486SX™, IntelSX2™, 486DX™, IntelDX2™, or SL Enhanced™ microprocessor, and the option to increase speed by adding an OverDrive™ or Pentium™ OverDrive™ upgrade processor.

These processors let you use 32-bit software designed for 80386-based systems, as well as applications designed for 80286 and 8088/8086 machines. Your Packard Bell system gives you 486 power and versatility, while supporting your current software.

Your 486 system includes two-level **password protection** and **power management** features, and also supports **Plug and Play** configuration software. Plug and Play **automatically detects and identifies** optional Plug and Play-compatible adapter cards, and **automatically selects the correct interrupt setting and driver for the device(s)**. This feature helps simplify system set-up by automatically configuring your Plug and Play compatible adapter cards. For added convenience, the Plug and Play ISA Configuration Utility also helps you configure optional ***non-compatible*** ISA adapter cards for use with your system!

Some systems may offer optional **Peripheral Component Interconnect (PCI) architecture**, which provides you with an easy-to-use, low cost, high performance environment that is significantly more reliable than systems employing VESA® Local Bus.

For improved energy efficiency, base model systems are EPA Energy Star compliant. These systems feature enhanced power management technology, for lower electrical consumption compared to conventional systems. (Note that the EPA Energy Star standard may not apply to your system if you install certain accessories requiring additional electrical power.)

Your 486 system will run software created for use with the MS-DOS operating system, as well as OS/2, UNIX, and Windows NT. You'll be able to run thousands of different programs available today.

Combine these features with Packard Bell's reliability, superior technical support, and an international network of dealerships and service centers, and your new 486 system stands out in the vast crowd of PC-compatible computers.

Before using your new computer system, please read this User's Guide to become familiar with it. If necessary, read your MS-DOS and Microsoft Windows User's Guides to learn the basic DOS commands and Windows techniques. By doing so, you'll save time and avoid common mistakes when setting up and using your system.

Before You Go On

Your system's components should include:

1. System unit
2. Enhanced PS/2 keyboard
3. This User's Guide
4. MS-DOS User's Guide and recovery disk
5. Utilities diskette (if included)
6. Owner information and warranty card
7. AC power cord
8. Mouse

NOTE Your system's inventory may differ slightly from this checklist.

About This User's Guide

This User's Guide is divided into eight parts:

1. Introduction
2. Quick Start
3. Setting Up
4. Putting Everything To Work
5. Internal Installations
6. Maintenance And Troubleshooting
7. Appendices
8. System Information Log

How To Use The User's Guide

If this is your first time using a computer, study this User's Guide carefully. Pay special attention to sections marked by these two symbols:

NOTE This symbol calls attention to especially useful information.

WARNING! This symbol appears next to critically important information or instructions. *Please read these sections carefully!* Failure to follow these instructions could cause injury, damage to the computer or other equipment, or loss of data stored on disks.

From time to time, this User's Guide will instruct you to enter commands into your computer. Those commands will look like this in the User's Guide:

`format x:` ENTER

In the example above, you are being asked to type "format x:" and then press the key marked "Enter."

Some procedures require that you press two or more keys at the same time. Those keystrokes will be joined with plus symbols, like this:

CTRL+ALT+Y

If you are an experienced computer user, you may want to begin with **Chapter 2: Quick Start. Otherwise, please start with Chapter 3: Setting Up.** Before you install additional devices into your system, read **Chapter 5: Internal Installations. Save this User's Guide for future reference.**

For your convenience, we have included a System Information Log at the end of this User's Guide. Please record information about your system into this log, in case you require technical support.

IMPORTANT! This User's Guide includes information for both **Model 3x3 Series** and **Model 4x4 Series** computer systems.

Compare your computer to the Figures and Specifications on the next four pages, to identify your particular system.

In several sections of this User's Guide, we outline instructions which refer to **Model 3x3 Series** or **Model 4x4 Series** systems. Pay close attention to instructions that pertain to your series.

Model 3x3 Series

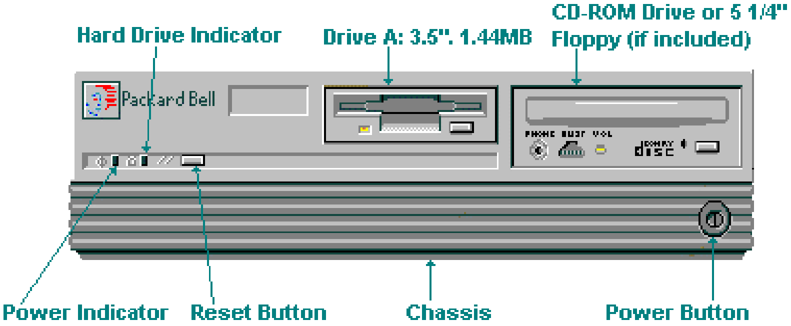


Figure 1-1: Front Panel Model 3x3 Series

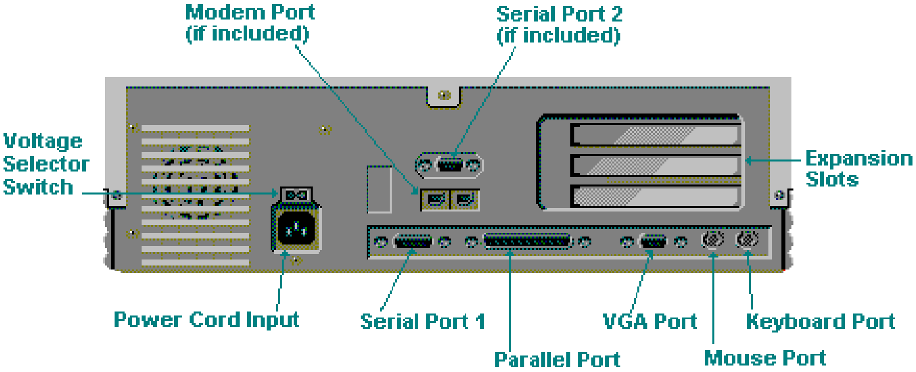


Figure 1-2: Rear Panel Model 3x3 Series

NOTE Your system may include an additional serial port or modem.

Model 3x3 Series

Features

- High performance 486 desktop computer
- 4 MB of RAM onboard standard, expandable to 64 MB on the motherboard
- 8 KB internal cache standard; optional external cache upgradeable to 128 or 512 KB
- Extended VGA Controller CL-GD5428 supports 1280 x 1024 x 16 colors, as well as 16.8 million colors in 640 x 480 resolution mode, with 1 MB video memory (standard); 1280 x 1024 x 256 colors with upgrade to 2 MB video memory
- Local Bus Windows Accelerator Video Controller for improved VGA and Windows performance
- 3.5", 1.44 MB (2.88 MB optional) Floppy Disk Drive, as Drive A
- 5.25", 1.2 MB Floppy Disk Drive, as Drive B (if included)
- 3 expansion slots, featuring 3 ISA (AT-compatible) 16-bit connectors. Optional PCI Riser Card features 1 ISA (AT-compatible) 16-bit connector, 1 PCI connector, and 1 combined expansion slot that accommodates either an ISA or a PCI adapter card.
- 3 Disk Drive Cavities

For a complete listing of features and specifications, refer to **Appendix C: Specifications.**

Model 4x4 Series

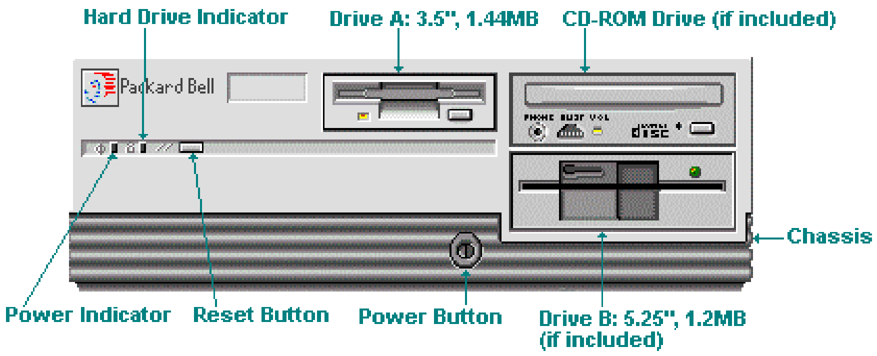


Figure 1-3: Front Panel Model 4x4 Series

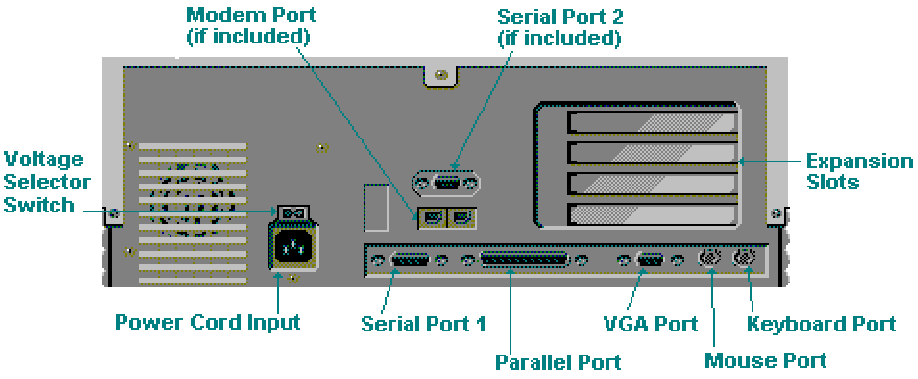


Figure 1-4: Rear Panel Model 4x4 Series

NOTE Your system may include an additional serial port or modem.

Model 4x4 Series

Features

- High performance 486 desktop computer
- 4 MB of RAM onboard standard, expandable to 64 MB on the motherboard
- 8 KB internal cache standard; optional external cache upgradeable to 128 or 512 KB
- Extended VGA Controller CL-GD5428 supports 1280 x 1024 x 16 colors, as well as 16.8 million colors in 640 x 480 resolution mode, with 1 MB video memory (standard); 1280 x 1024 x 256 colors with upgrade to 2 MB video memory
- Local Bus Windows Accelerator Video Controller for improved VGA and Windows performance
- 3.5", 1.44 MB (2.88 MB optional) Floppy Disk Drive, as Drive A
- 5.25", 1.2 MB Floppy Disk Drive, as Drive B (if included)
- 4 expansion slots, featuring 4 ISA (AT-compatible) 16-bit connectors. Optional PCI Riser Card features 2 ISA (AT-compatible) 16-bit connectors, 1 PCI connector, and 1 combined expansion slot that accommodates either an ISA or a PCI adapter card.
- 4 Disk Drive Cavities

For a complete listing of features and specifications, refer to **Appendix C: Specifications**.

2

Quick Start

This chapter is intended for the ***experienced*** computer user. **If you haven't had experience using personal computers, skip this chapter and go to Chapter 3: Setting Up**. If you've had experience with PC-compatible systems, this chapter will show you the essential steps to get the system running.

WARNING! Make sure that power to the computer is turned **OFF** before connecting any devices. Connecting devices with the power on could damage the system's motherboard.

Choosing A Location

Choose an uncluttered location for your system. This location should be properly ventilated, dry and out of direct sunlight. **If you place your system vertically into a computer stand, be sure to stand the system with its right side panel facing downward toward the floor. To ensure proper system ventilation, the ventilated left side panel must face up toward the ceiling, and must not be blocked!**

WARNING! If your system includes a CD-ROM drive, or if you install one, locate the system horizontally on a table or desktop. Do not stand the unit vertically on its side (e.g., in a computer stand).

Unpacking

Keep the packing materials for future moving purposes, or in case your computer requires service.

Checklist

Verify that you have everything by checking against the items listed in **Chapter 1: Introduction**.

Making Connections

WARNING! Computer power must be OFF before connecting any devices, to protect the system's motherboard.

Before your computer system can operate, the following connections need to be made. If the connectors do not fit properly, please do not force them. Check the connectors to see that the type is right, and that none of the pins have been bent.

Keyboard

Connect the keyboard to the **purple-labeled** keyboard connector (J1) on the system's rear panel.

Monitor

VGA Monitor Connect the cable from your VGA monitor to the **orange-labeled** video display port on the system's rear panel. The connector on the end of the monitor cable should be a DB15 (15 pin) male connector. Your video display port should be a DB15 female receptacle.

WARNING! To ensure proper connection, make sure that the orientation of your monitor's connector ***exactly matches*** **the orientation of the Video (VGA) port! The connector's wide end should be at the top of the port, while its narrow end should be at the bottom of the port.**

Other monitor types

To use a **TTL monitor** (Monochrome, CGA or EGA), you must install an add-on video card and disable the computer's on board VGA controller.

The connector on the TTL monitor cable should be a DB9 (9 pin) male connector. Correspondingly, the connector on your video card should be a DB9 (9 pin) female receptacle.

To disable the on-board **VGA controller**, remove the jumper from pins 2 and 3 and place it over pins **1** and **2** of jumper **(J19)** on the motherboard (refer to **page D-2**).

Printer

Parallel

The **dark gray-labeled** Parallel Port on the computer's rear panel is bi-directional. It can be configured in standard mode **(output only)**, for compatibility with the Centronics parallel printer interface. Alternatively, the extended mode **(bidirectional)**, or extended capabilities **(ECP)** options allow it to send and receive data to and from external devices, such as a scanner or tape backup system. The parallel port's default setting should be **output only**. (To change the parallel port's value in the Setup Utility, see the **Initial Setup section on page 2-6** for information.) Connect the Centronics end of the cable to either your parallel printer or external device, and the end with the male DB25 (25 pin) connector to the **dark gray-labeled** female DB25 Parallel Port (J5) on the computer's rear panel.

Serial Port 1

Your system includes an onboard serial port (Serial Port 1) located at (J6) on the motherboard. Your serial port is RS232 compatible, so you can connect your serial printer to the yellow-labeled serial port (marked with **IOIOI** on the lower rear panel). If the printer cable connector and the serial port connector do not match, you may need to purchase a 9-to-25 pin converter from your dealer. Serial Port 1 (COM A) should be default set to COM 2 (IRQ 3). If necessary, you can change the COM and IRQ settings in the Advanced sub-menu of the Setup Utility. For information on changing the settings, see the **Initial Setup section on page 2-6**. Next, you must issue the appropriate MODE command. See your printer's user manual and the MS-DOS User's Guide for details.

Serial Port 2 (optional)

Your system may include a second serial port (labeled **IOIOI** on the middle rear panel). Serial Port 2 is RS-232 compatible. This port should be default set to **COM 1 (IRQ 4)** (or **Disabled**, if it is not included with your system). If necessary, you can change the COM and IRQ settings in the **Modem/COM B** field in the Advanced sub-menu of the Setup Utility.

Modem (optional)

If an internal modem was installed in your system, the **Modem/COM B** setting should display as **COM 1 (IRQ4)** in the Setup Utility's ***Advanced*** sub-menu of the Setup utility. (This option will also be set to COM 1/IRQ 4 if your system includes an optional Serial Port 2 instead of a modem.) Otherwise, the Modem/COM B port's default setting should be disabled. (To change the configuration, see the **Initial Setup section on page 2-6** for information.)

Locate the telephone cord provided with your modem. Plug one end into your phone wall socket and the other end into the modem input port. Make sure the cord "clicks" into place at both ends.

Connecting an External Modem

Connect your external modem to the **yellow-labeled** Serial Port 1 (or optional Serial Port 2, labeled **IOIOI** on the *middle* rear panel). Your serial port(s) is/are RS232 compatible, so you can connect your external modem to either port. (See **Figure 3-4** for location of the serial port connectors.) Plug the phone cable between your modem's LINE port and your telephone wall socket. If your modem has a second port labeled PHONE, connect your telephone to it. Remember to connect the external modem's power cord to your surge protector or AC wall outlet.

Mouse

NOTE See **Appendix F - Using the Mouse** for complete instructions.

WARNING! Power to the computer must be turned **OFF** before installing the mouse. Connecting a mouse with the power on could damage the system's motherboard.

PS/2 Connect your PS/2 mouse to the **green-labeled** mouse port (J2) on the back of your computer. The PS/2 Mouse option should be Enabled (default) in the Setup Utility's Advanced Setup sub-menu (discussed in **Chapter 3**).

Serial Connect your serial mouse to either the **yellow-labeled** Serial Port 1 or Serial Port 2, if installed.

Bus To install a bus mouse, you must install the adapter card that came with the mouse in one of the expansion slots on the motherboard.

NOTE Do not install a full-length adapter card in the lowest expansion slot.

Floppy Disk Drives

Your computer comes with one 3.5", 1.44 MB (2.88 MB optional) high density floppy disk drive standard (Drive A:); it may also be equipped with a 5.25", 1.2 MB high density floppy disk drive (Drive B:).

Floppy Disk Drive Protector Card

If your system has a 5.25" floppy disk drive, you will find a protector card inserted in the drive. **Remove the floppy disk drive protector card before turning the power on**. Leaving this card in place when the computer is turned on may damage your floppy disk drive. Save the card, insert it in the drive and close the door whenever the computer will be shipped or stored.

Power Cords

Before operating your computer, please make sure that all the power cords to the various devices are properly connected. Also make sure that the voltage selectors, if any, on all the devices are set to the right voltage.

Initial Setup

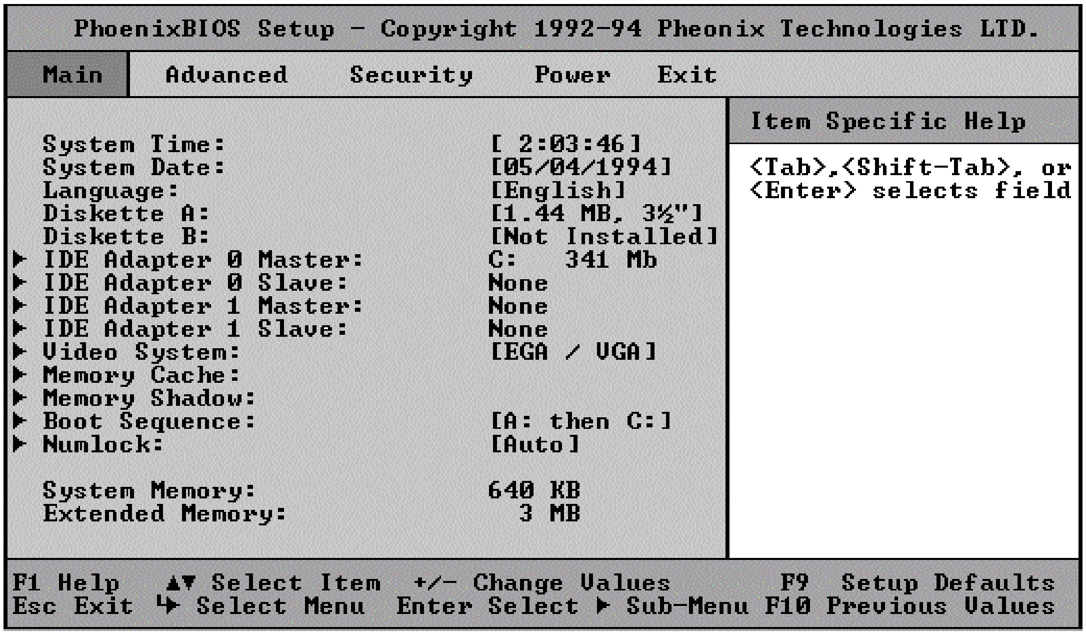
Now that you have made all the connections, your system should be ready to use. Your computer has been "pre-configured" at the factory to properly use whatever optional equipment was originally installed.

If you have changed any part of your system's configuration, you must run the SETUP program so that your computer will "remember" the changes.

To start SETUP, press the **F2 key on your keyboard during the POST test (which runs when the system first boots up). Now you are in the Setup mode. You should see the Setup program's Main Menu on the screen (Figure 2-1).**

If necessary, press the left or right arrow (cursor) keys to move to the additional setup options in the Advanced, Security, and Power menus, or to return to the Main menu.

Press the Up or Down Arrow keys to select any item from the Setup menu. ***Note that menu items preceded by an arrowhead-shaped symbol contain a sub-menu*** *that features additional configuration options*. To access the item's sub-menu, highlight the item with the cursor, then press the **ENTER** key. (To return to the previous menu, press the **ESC** key.)



```
    PhoenixBIOS Setup - Copyright 1992-94 Pheonix Technologies LTD.
  Main     Advanced     Security     Power    Exit
                                                    Item Specific Help
  System Time:                     [ 2:03:46]
  System Date:                     [05/04/1994]    <Tab>,<Shift-Tab>, or
  Language:                        [English]       <Enter> selects field
  Diskette A:                      [1.44 MB, 3½"]
  Diskette B:                      [Not Installed]
▶ IDE Adapter 0 Master:            C:   341 Mb
▶ IDE Adapter 0 Slave:             None
▶ IDE Adapter 1 Master:            None
▶ IDE Adapter 1 Slave:             None
▶ Video System:                    [EGA / VGA]
▶ Memory Cache:
▶ Memory Shadow:
▶ Boot Sequence:                   [A: then C:]
▶ Numlock:                         [Auto]

  System Memory:                   640 KB
  Extended Memory:                   3 MB

F1 Help    ▲▼ Select Item   +/- Change Values        F9  Setup Defaults
Esc Exit   ↵ Select Menu   Enter Select ▶ Sub-Menu F10 Previous Values
```

Figure 2-1: Setup Opening Screen

Press the plus (+) or minus (-) keys on the numeric keypad to change the setting of the item.

Press the **ESC** key to move to the Exit menu. Highlight the desired option (e.g., Save Values and Exit, Discard Values and Exit, Get Default Values, Load Previous Values, Save Current Values) and press the **ENTER** key. Each of the items must be set correctly. For a detailed look at the Setup procedure, please see **Chapter 3: Setting Up**.

Plug and Play Configuration

Your system supports Plug and Play configuration software. **Plug and Play simplifies system setup for you by detecting and identifying optional Plug and Play compatible adapter cards**. Plug and Play also **configures your system to work with these devices**. Additionally, its ISA Configuration Utility helps you configure non-compatible ISA adapter cards for use with your system.

NOTE

You won't need to run the ISA Configuration Utility when installing Plug and Play-compatible adapter cards, because these cards are recognized and configured automatically. For information on using the Setup Utility for Plug and Play configuration, see the Plug and Play Configuration Sub-menu in **Chapter 3: Setting Up**. To install a **non-compatible** card (or to learn more about using the ISA Configuration Utility), see **Appendix H: ISA Configuration Utility**.

3

Setting Up

This chapter tells you how to assemble and customize your computer system. By reading this chapter carefully, you'll save time and avoid common mistakes when setting up and configuring your system.

Unpacking

At this point, you should have removed your computer from the box. **Right now, please do the following**:

- Check to see if your system is missing anything. Please refer to the checklist in **Chapter 1: Introduction;** your system should include those items. If an item appears to be missing, contact Packard Bell Customer Service for assistance.
- Save your proof-of-purchase, original carton and packing materials. You will need to provide proof-of-purchase to obtain warranty service. If you need to return your system for service, you must ship it in the original carton. It's also the best way to keep the system safe if it needs to be moved.

Choosing a Location

Set up your computer system in a suitable location that is dry and cool, and has proper ventilation. Place the system on a flat, sturdy surface. For standard desktop locations, the main unit must have at least two to three inches of clearance on all sides (except the bottom) for proper heat dissipation.

If you place your system vertically into a computer stand (e.g., next to your desk), be sure to stand the system with its right side panel facing down toward the floor. For proper system ventilation, the ventilated left side panel should face up toward the ceiling, and should NEVER be blocked!

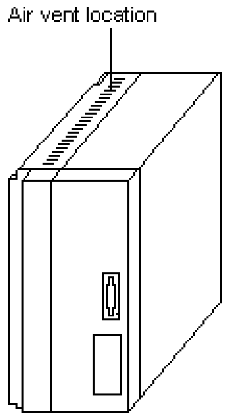


Figure 3-1: Air Vent

WARNING! **If your system includes a CD-ROM drive, or you install one, place the system horizontally on a table or desktop. Do not stand the unit vertically on its side (e.g., in a computer stand).**

The entire system, including the main unit, the keyboard, the video monitor and any other peripheral devices, should be kept away from direct sunlight or any other source of extreme heat. Direct sunlight could cause internal overheating, or blemish the exterior of your computer system.

Keep your computer system away from devices which generate radio frequency interference, such as stereo equipment and television sets. Your computer system should also be kept at least three feet from sources of strong magnetic fields, since they may destroy the information stored on your diskettes and hard disks.

Making the Connections

WARNING! **Make sure that power to the computer is turned OFF before connecting any devices. Connecting devices with the power on could damage the system's motherboard.**

Now, you can connect the devices together and put the system to work. The connections to be made can be categorized into **signal cable connections** and **power cord connections**. This chapter deals with the most common devices you may want to install. The only tool(s) you may need are a small flat-head and/or a Phillips-head screwdriver.

For installation of devices which require access to the interior of your computer, see **Chapter 5: Internal Installations**. For installation instructions on devices which are not covered in this section, please refer to the manual for the device.

Signal Cable Connections

WARNING! **Computer power must be OFF before connecting any devices, to protect the system's motherboard.**

Keyboard **Make sure the computer power is OFF.** Connect the keyboard to the main unit's **purple-labeled** keyboard port, as shown in Figure 3-2. **Insert the keyboard connector carefully**; it is designed to fit into the keyboard port in only one way.

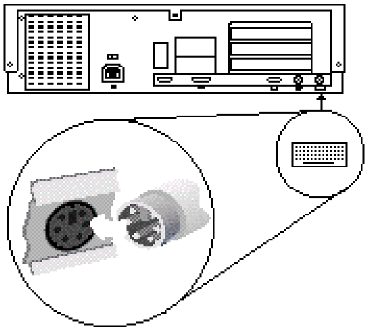


Figure 3-2: Keyboard Connector

Monitor Connect the monitor cable from your VGA monitor to the **orange-labeled** video display port on the back of the computer. The connector on the end of the monitor cable should be a DB15 (15 pin) male connector. Accordingly, your video display port should be a DB15 (15 hole) female receptacle. Tighten the two screws on the cable connector to secure the connection.

WARNING! To ensure proper connection**, make sure that the orientation of your monitor's connector *exactly matches* the orientation of the Video (VGA) port! The connector's wide end should be at the top of the port, while its narrow end should be at the bottom of the port.**

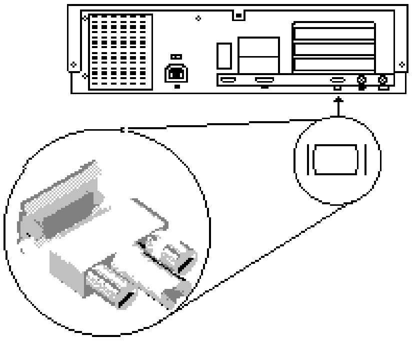


Figure 3-3: Video (VGA) Connector

TTL Monitor

To use a TTL monitor (Monochrome, CGA or EGA), you must install an add-on video card and disable the computer's on-board VGA controller. (See **Chapter 5: Internal Installations** for information on installing adapter cards.)

The connector on the TTL monitor cable should be a male DB9 (9 pin) connector. Correspondingly, the connector on your video card should be a female DB9 (9 hole) receptacle.

WARNING!

Make sure that the connector's "pin count" and the receptacle's "hole count" match. **Don't force the connection!** If the connector does not attach properly, check to see if any pins are bent. If so, carefully adjust them with a pair of needle-nose pliers and retry.

To disable the on-board VGA controller, remove the jumper from pins 2 and 3 and place it over pins 1 and 2 of jumper **(J19)** on the motherboard. See **Figure D-1** in **Appendix D: Motherboard Connectors and Jumpers** for the jumper's location on your system's motherboard (main circuit board).

For your reference, **Table 3-1** lists some compatible video cards and monitors, and the kinds of display you will get from the combinations.

Table 3-1: Compatible Monitors

Monitor	Display Capability
HGC (Hercules) or MDA (Monochrome Display Adapter)*	720 X 350 maximum Monochrome
CGA (Color Graphics Adapter)*	640 X 200 maximum 16 colors maximum
EGA (Enhanced Graphics Adapter)*	640 X 350 maximum 64 colors maximum
VGA (Video Graphics Array)OR	640 X 480 maximum 256 colors maximum for 512KB 16.7 million colors maximum for 1MB+
SVGA OR	800x600 maximum 256 colors maximum for 512KB 64K colors maximum for 1MB+
Extended VGA (supported on system board)	1024 X 768 maximum 16 colors maximum for 512KB 256 colors maximum for 1MB+ 64K colors maximum for 2MB 1280x1024 maximum 16 colors maximum for 1MB+ 256 colors maximum for 2MB

*requires separate video card
+standard memory configuration

Printer

Your printer can be either **parallel** or **serial**. In parallel connection, data is transferred to the printer one byte (8 bits) at a time; in serial connection, data is sent bit by bit. For details on the type of connection you should make, see your printer's user's manual.

Parallel Printer Connection

The **dark gray-labeled** Parallel Port on the computer is bi-directional. It can be configured in standard mode **(output only),** for compatibility with the Centronics parallel printer interface. Alternatively, the extended **(bidirectional)** and Extended Capabilities Port **(ECP)** modes allow it to send and receive data to and from external devices, such as a scanner or tape backup system. The parallel port's default setting should be **output only**. (To change the parallel port's value in the Setup Utility, see the **Initial System Setup** section on **page 3-13** for information.) Connect the Centronics end of the cable to your parallel printer (or other external device), and the end with the male DB25 (25 pin) connector to the **dark gray-labeled** female DB25 (25 hole) Parallel Port on the computer's rear panel. (**See Figure 3-4.**)

The parallel port's default **print destination** should be set at **LPT1**: (**L**ine **P**rin**T**er 1) by the factory. To use the printer connected to this port, make sure that you've designated your print destination as **LPT1** in the Setup Utility program. If you want to change the destination, see the **Initial System Setup** section later in this chapter.

NOTE If you have a monochrome display adapter card, there may be a parallel printer port provided on the card. If you want to connect your printer to this port, it will be LPT1; the port built into the motherboard will be LPT2.

Serial Printer Connection

If your printer has a serial port, connect one end of your serial printer cable to the printer; attach the 9 hole (female DB9) connector on the other end to the **yellow-labeled** Serial Port A, marked with **IOIOI** on your computer's rear panel. If your system includes an optional Serial Port B (labeled **IOIOI** on the *middle* rear panel), you can use this port, instead. See the rear panel illustration (Figure 3-4) for the location of the serial port(s).

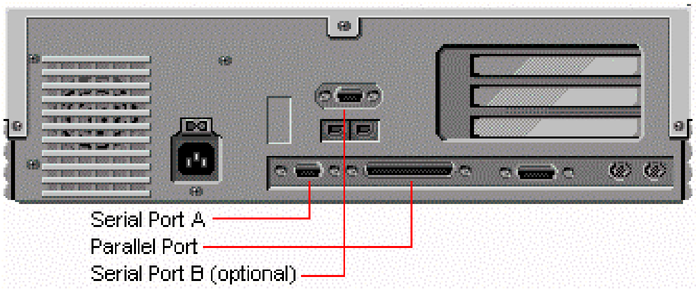


Figure 3-4: Serial and Parallel Port Locations

NOTE If your printer cable is a female RS232 25-pin type, you may need to add a DB9-to-DB25 converter to the cable to connect it to your serial port.

NOTE Serial Port 1 (COM A) should be default set for COM 2 (IRQ3); your optional Serial Port 2 (Modem/COM B) should be default set for COM 1 (IRQ 4), if it is installed in your system. However, you can change these settings in the Setup Utility' s Advanced menu (discussed under Initial System Setup in this chapter).

Before you can print with your serial printer, you must tell your computer how to communicate with it, by using the MODE command. At any DOS prompt, type:

`MODE COMx: 9600,N,8,1` (and press the **ENTER** key)

where *x* is the COM port that your printer is connected to. (The items that follow the colon may be different from those shown, depending on your printer. Consult your printer's user manual for details.)

In order to print with certain software, you may need to instruct your computer to redirect output for a line printer port to a serial port. To do this, type:

`MODE LPTy:=COMx:` (and press the **ENTER** key)

at any DOS prompt. Replace *y* with the number of the line printer port you want to use, and *x* with the number of the COM port that your printer is connected to.

NOTE These commands must be issued each time you start your computer. If you want them issued automatically at system startup, you can place them in your AUTOEXEC.BAT file.

Refer to your printer's user's manual and MS-DOS User's Guide for more information on these commands, since different printers may require different parameters.

Modem (optional)

If an internal modem is included in your system, the modem port setting **(Modem/COM B) should be set to COM 1/IRQ 4 in the Setup Utility' s Advanced sub-menu. (If your system includes an optional Serial Port 2 instead of a modem, it will also be default set to COM 1/IRQ 4. Otherwise, the default setting should be Disabled.) If you install an internal modem into one of your system's expansion slots, be sure to configure the Modem/COM B setting with COM port and IRQ settings which are different than your COM A (Serial Port 1) settings! Contact Packard Bell Technical Support if you require assistance in selecting the proper settings. (See below for information on connecting an external modem to your serial port.)**

To connect an internal modem to your phone line:

1. Locate the phone wall socket you want to use. If a phone is already plugged into this socket, unplug it.

2. Look for the two modem sockets on the back of your computer. They are standard phone sockets that may be located on the middle rear panel **OR** in one of your computer's expansion slots (see **Figure 3-5** for Model 3x3 Series and Model 4x4 Series systems.)

3. Find the phone cable provided with your modem. Plug one end into the wall socket and the other into the modem's line port (left port). Make sure the plug "clicks" into place at both ends.

4. Plug your telephone into the splitter cable's (or 2-socket modem's) **PHONE** jack, if you'll want access to a phone. Make sure the plug "clicks" into place.

5. Lift the receiver and listen for a dial tone. If you don't hear one, make sure all three connections are secure. ***(Note: You don't need to plug a telephone into the modem for it to function.)***

To connect an external modem to your system:

1. Make sure your computer power is **OFF.**
2. Connect the modem's RS232 cable to your **yellow-labeled** Serial Port A or optional Serial Port B (marked **IOIOI** on the computer's *middle* rear panel). Your serial port(s) are RS232 compatible, so you can connect your external modem to either port. (See **Figure 3-4** for location.)
3. Plug the phone cable between your modem's LINE port and your telephone wall socket.
4. If your modem has a second port labeled PHONE, connect your telephone to it. If not, and you want to connect your telephone to the modem's phone line, replace your modular telephone jack with a modular duplex jack. Then connect the telephone to one of the jacks, and the modem to the other.
5. Finally, connect the external modem's power cord to your surge protector or AC wall outlet.

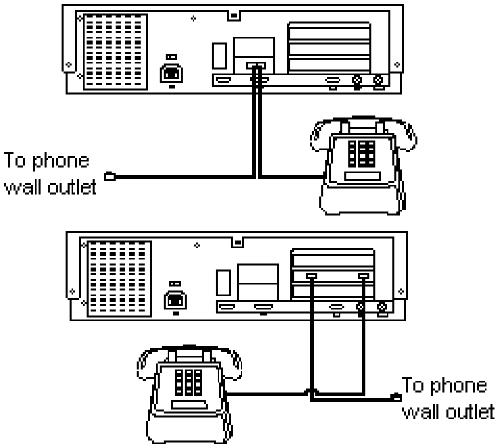


Figure 3-5: Internal Modem Connections

Mouse

There are three types of mouse devices that can be used with your system: a **PS/2 Type Mouse** (included with your system), a Serial Mouse and a Bus Mouse. To install your mouse, follow the instructions below.

WARNING!

Computer power must be turned OFF before connecting the mouse, to avoid damaging the system's motherboard.

NOTE

See Figure 3-6 for the PS/2 mouse port location on your system's rear panel.

PS/2 Type (included)

Connect your PS/2 Type mouse to the **green-labeled** mouse port on the back of your computer. (The Advanced Setup Menu's **PS/2 Mouse** option is default set to Enabled at the factory. **If you have changed this setting, be sure to change it back to Enabled**. See the Initial System Setup section later in this chapter for details on how to change settings.)

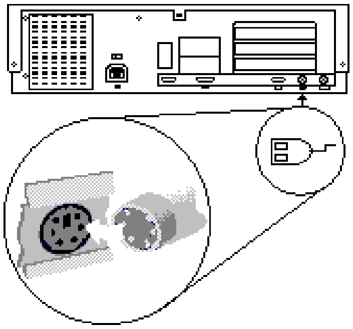


Figure 3-6: PS/2 Mouse Port

Serial Mouse (optional)

To connect a serial mouse, plug the serial mouse cable into your **yellow-labeled** Serial Port A or optional Serial Port B (marked **I0I0I** on the computer's *middle* rear panel). If your mouse has a female RS232 connector, you may need to add a DB9-to-DB25 converter to connect the mouse to your system.

Bus Mouse (optional)

To install a bus mouse, you must install a Mouse Bus Card in one of your system's expansion slots. (See **Chapter 5: Internal Installations** for information on installing optional adapter cards.)

NOTE

If you are planning on purchasing a mouse, and if your serial port is already occupied, we strongly suggest that you purchase a PS/2 Type mouse. By doing so, you'll avoid adding an I/O (input/output) card.

See **Appendix F: Using the Mouse** for complete instructions regarding your mouse.

Power Cord Connections

Make sure that the voltage selector switch on the system's rear panel is set for the voltage used in your area.

WARNING! **If the voltage selector switch is set improperly, serious damage to your system may result. If you are not sure what voltage you are getting from your power line, call your electric company.**

NOTE We strongly suggest that you connect your system's devices to a multiple-outlet surge protector ("power strip") to help protect against damage caused by electrical surges in the power line.

To connect the power cord to the main unit, insert the cord's female connector into the male AC input jack on the computer's rear panel.

Plug the power cord's three-pronged connector into your surge protector ("power strip") or grounded AC wall outlet. Then plug your system's other AC-powered devices into your surge protector or grounded AC wall outlet.

WARNING! Make sure that the voltage selectors on all your devices are set to the correct voltage. Additionally, if you're using a surge protector ("power strip"), allow it to have a wall outlet all to itself. Your system or power strip must be plugged into a *grounded* AC outlet. **Do not try to convert the three-pronged (grounding) plug for use with a two-prong (non-grounded) outlet.**

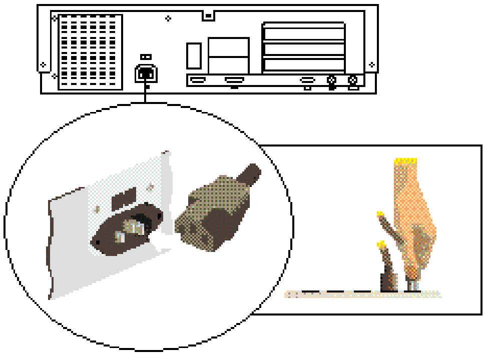


Figure 3-7: AC Power Cord Connector

Initial System Setup

When your computer was first assembled, certain information about its configuration was stored in CMOS RAM, a special type of memory backed up by a battery. CMOS RAM "remembers" your computer's configuration even when the computer is switched off.

From time to time, you may need to change the information stored in CMOS RAM, most often:

- Whenever you add or remove a **floppy** or **hard disk drive**, **system memory** or change the type of **video display**.
- If you change your system's **hardware configuration**, for example, by adding a modem or serial mouse.
- To reset the built-in **clock/calendar** to the correct time and/or date.
- To make certain adjustments (explained later in this chapter) that can improve your computer's performance.
- If the information stored in CMOS RAM has been accidentally lost.

Each time you start the computer (*with the power switch*) or restart it (*by pressing* **CTRL+ALT+DEL** *or your reset button*), the POST (Power On System Test) compares the configuration information stored in CMOS RAM to the system's actual configuration. If the two ***differ***, an **error message** will appear on your monitor, indicating the problem and advising you to run the SETUP utility, as shown in the following example:

```
Failure Fixed Disk 2

Press <F1> to resume, <F2> to Setup
```

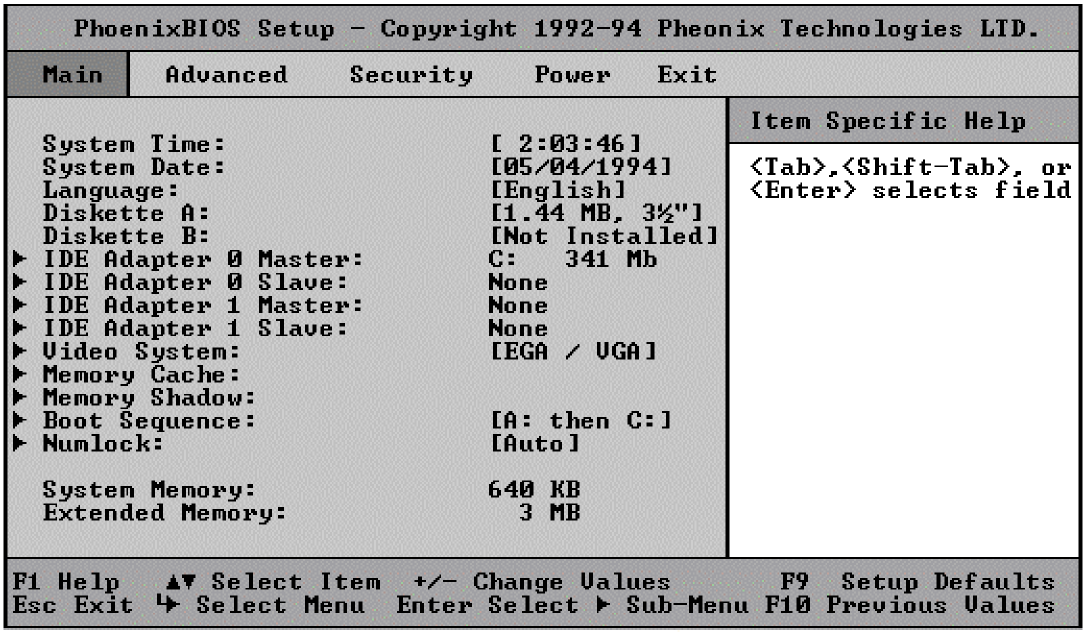
You should press F2 at this time to use the SETUP program. **(*If the configuration is correct, no error message will be displayed; in this case, you won't need to run SETUP.*)**

NOTE

If you press **F1**, the computer will try to start normally, but you won't be able to use any new devices you have installed until you add them to the configuration by running the SETUP program. In the above example, the hard drive will not function if it is not the same type specified in the configuration. In this event, you would need to insert a "bootable" floppy disk in Drive A: before pressing **F1**.

You can also run SETUP while the POST test is still running by pressing the ***F2*** *key during system boot-up.*

You will see the Setup Main Menu shown in **Figure 3-8**. Use the **Up** or **Down arrow (cursor)** keys to move the highlight cursor over the desired option. The **Tab, Shift-Tab** or **ENTER** keys let you switch fields within an option (*e.g. by pressing the Tab key, you can move from the "hours" field to the minutes field within the System Time option*). Use the **Plus** or **Minus keys** on the numeric keypad to change the setting of each option.



```
    PhoenixBIOS Setup - Copyright 1992-94 Pheonix Technologies LTD.
  Main     Advanced     Security     Power    Exit
                                                     Item Specific Help
  System Time:                    [ 2:03:46]
  System Date:                    [05/04/1994]      <Tab>,<Shift-Tab>, or
  Language:                       [English]         <Enter> selects field
  Diskette A:                     [1.44 MB, 3½"]
  Diskette B:                     [Not Installed]
▶ IDE Adapter 0 Master:           C:    341 Mb
▶ IDE Adapter 0 Slave:            None
▶ IDE Adapter 1 Master:           None
▶ IDE Adapter 1 Slave:            None
▶ Video System:                   [EGA / VGA]
▶ Memory Cache:
▶ Memory Shadow:
▶ Boot Sequence:                  [A: then C:]
▶ Numlock:                        [Auto]

  System Memory:                  640 KB
  Extended Memory:                  3 MB

F1 Help   ▲▼ Select Item  +/- Change Values        F9  Setup Defaults
Esc Exit  ↵ Select Menu  Enter Select ▶ Sub-Menu F10 Previous Values
```

Figure 3-8: Setup Main Menu

Several options described below feature a **Sub-Menu**, which you can use for additional configuration of your system. These options are preceded by an **arrowhead-shaped (>)** symbol in their menu listing. To access the Sub-Menu, make sure the highlight cursor is over the desired option, then press the **ENTER** key on your keyboard. The screen display will switch to the Sub-menu for the optionn you selected. To **exit** from a Sub-menu and return to the primary menu, press the **ESC** key.

NOTE Depending on the system you purchased, your SETUP menus may appear slightly different than those illustrated. If you need assistance when using the Setup Utility, contact Packard Bell Technical Support.

Main Setup Menu

System Time To set the system time, use the Up and Down Arrow keys. Only the hours and minutes fields can be changed; the seconds field can be reset to 00 by pressing the left or right arrow key.

System Date Use the arrow keys to set the system date. The Date option contains three fields: month, date and year. All fields can be reset.

Language This option lets you select from among the following display languages:

- English (Default)
- German (Deutsch)
- Italian (Italiano)
- French (Français)
- Spanish (Español)

NOTE If you add a PCI Riser Card upgrade to your system, you'll need to upgrade your system's BIOS with the PCI BIOS. (If your system came from the factory with the PCI Riser Card installed, the BIOS should already be updated.) The PCI BIOS currently supports the English, French (Français) and Spanish (Español) languages.

Diskette A:/B: This option sets the floppy disk drive(s) you have. The system supports the following types:

- 5.25 inch, 360 KB
- 5.25 inch, 1.2 MB
- 3.5 inch, 720 KB
- 3.5 inch, 1.44 MB
- 3.5 inch, 2.88 MB (optional)

The default setting for the Diskette A: floppy drive is 3.5 inch, 1.44MB (3.5 inch, 2.88MB optional). If your system includes a second 5.25 inch floppy drive, Diskette B: should be set at 5.25 inch, 1.2MB. If your system has more than one floppy disk drive, make sure that both drives are set accordingly.

IDE Adapter 0/1 (Hard Disk Drive)

This option is used to specify the hard drive type(s) installed in your system**. IDE Adapter 0 Master/Slave** configures your system's **Local Bus IDE (primary) controller**, while **IDE Adapter 1 Master/Slave** configures your system's **ISA IDE (secondary) controller**. Each controller can accommodate (2) hard disk drives, up to a total of four.

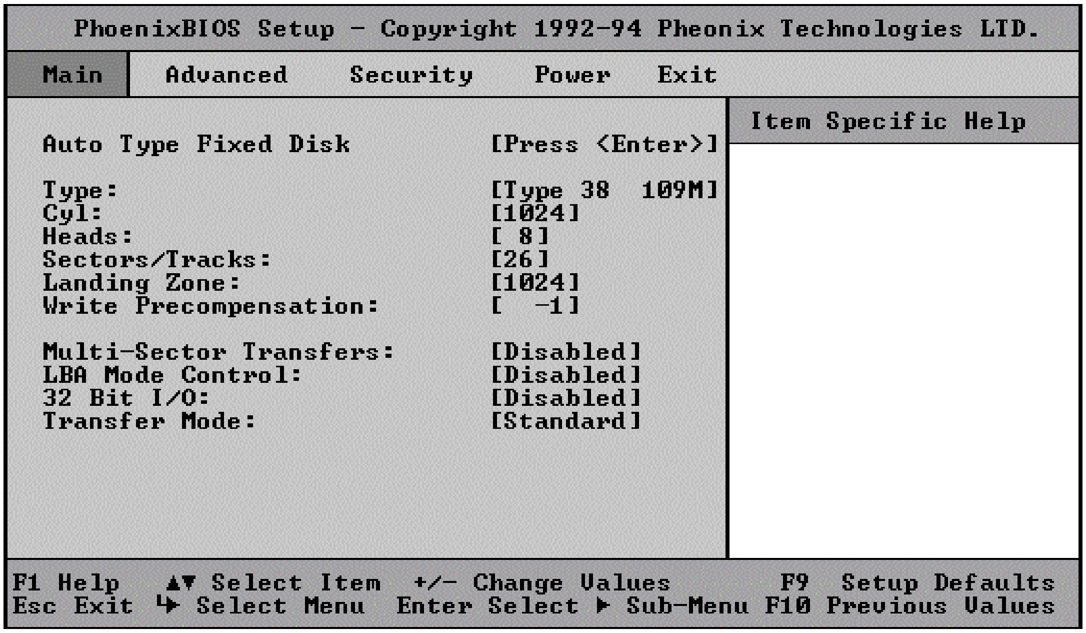
Important!

Your system can boot up from the (primary) Local Bus IDE Connector 0, located at (J24) on your motherboard, rather than the (secondary) IDE Connector 1, located at (J23). When adding a hard disk drive to your system, be sure to connect your primary master (C:\) drive to (J24). (To change your hard drive's Master/ Slave designation, see the documentation included with the drive.)

The **Autotype** option (default) will detect a variety of hard disk drives, and configure the appropriate settings for the hard drive(s) automatically. However, "Autotype" may not work with all types of hard disk drives. If your hard disk is not automatically detected by the system after you've specified the "Auto" option, you may need to change this setting to specify the type of hard drive included in your system. The type of hard disk drive(s) installed in your system must be specified correctly. You can specify the drive type(s) (and see their respective parameters) in **the IDE Adapter 0/1 Master/Slave Sub-Menu**, which can be accessed by pressing the **ENTER** key while the **IDE Adapter 0/1** field is highlighted.

NOTE

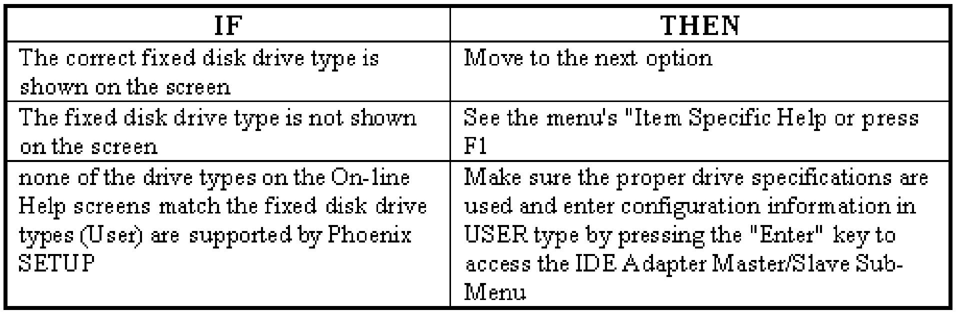
If you don't know the type of hard disk drive you have, see "Your System Credentials (Note to Customer)" (packaged with this system), or contact Packard Bell Technical Support for assistance.


PhoenixBIOS Setup - Copyright 1992-94 Pheonix Technologies LTD.
Main
Advanced
Security
Power
Exit
Item Specific Help
F1 Help ▲▼ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↵ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

```
Auto Type Fixed Disk          [Press <Enter>]

Type:                         [Type 38  109M]
Cyl:                          [1024]
Heads:                        [ 8]
Sectors/Tracks:               [26]
Landing Zone:                 [1024]
Write Precompensation:        [   -1]

Multi-Sector Transfers:       [Disabled]
LBA Mode Control:             [Disabled]
32 Bit I/O:                   [Disabled]
Transfer Mode:                [Standard]
```

Figure 3-9: IDE Adapter O/I Master/Slave Sub-menu

The following table explains how to handle special conditions when configuring hard disk(s).



IF	THEN
The correct fixed disk drive type is shown on the screen	Move to the next option
The fixed disk drive type is not shown on the screen	See the menu's "Item Specific Help or press F1
none of the drive types on the On-line Help screens match the fixed disk drive types (User) are supported by Phoenix SETUP	Make sure the proper drive specifications are used and enter configuration information in USER type by pressing the "Enter" key to access the IDE Adapter Master/Slave Sub-Menu

The following specifications are required in order to configure the hard disk drives:

- Number of cylinders
- Number of heads
- Number of sectors/track
- Landing zone
- Write precompensation

You can also select the following options for your Fixed Disk(s):

- Multi-Sector Transfers (number of sectors per block)(default = Disabled)
- LBA Mode Control (Logical Block Disk Addressing is used, instead of Cylinders, Heads, & Sectors) (default = Disabled)
- 32-bit I/O (Data Transfers enabled) (default = Disabled)
- Transfer Mode (selects method for moving data to/from the drive) (default = Standard)

NOTE

***IDE Adapter 0** supports all four of the above options. IDE Adapter 1 supports the **LBA Mode Control** and **Transfer Mode** options only. The Autotype setting should configure these settings for your hard drive automatically. Contact Packard Bell Technical Support if you need assistance.*

Video System

The type of Primary Display Adapter must be specified. The choices are:

- EGA/VGA display adapter (default)
- CGA 80 x 25 (Color Graphics Adapter)
- Monochrome display adapter

The **Video System sub-menu** (which you can access by highlighting the Main Menu's **Video System** option and pressing the **ENTER** key) contains configurable settings for **Monitor Type** (0-7) (default = Type 3) and **VGA Refresh (Normal/High)** (default = Normal). If necessary, see the documentation included with your monitor for information on selecting the proper Monitor Type and VGA Refresh settings.

Memory Cache

The **Memory Cache Sub-Menu** contains options for **enabling cache** and **Caching of Video BIOS**, as well as specifying the **start address** and **size** of non-cacheable regions.
Cache means cache memory, consisting of internal cache and external cache. Leave this option "Enabled," unless you have a specific need to disable it. A high performance 32-bit cache controller is included to improve system performance. It defines certain cycles as non-cacheable without using its non-cacheable access input. These include I/O cycles, interrupt acknowledge cycles, and halt/shutdown cycles. The system also defined some memory as a non-cacheable area when this computer was manufactured.

The cacheable cycles can be divided into four processes: Read Hit, Read Miss, Write Hit, Write Miss. **Read Hit** means the system reads the data from SRAM and, therefore, does not have to look for the data in DRAM. **Read Miss** means the system cannot find the data from SRAM; it then reads the data from DRAM and will copy the same data to SRAM. **Write Hit** means the system writes the data onto SRAM and DRAM. **Write Miss** means the system only writes the data onto DRAM.

You can add **external cache** to improve system performance. This system provides sockets for external cache SRAM (Static Random Access Memory) chips. The sockets are located at (U16), (U19), (U25), (U32), (U55) and (U58) on the motherboard. (See **Chapter 5: Internal Installations** for cache upgrade instructions.)

Memory Shadow

The **Memory Shadow Sub-Menu** contains options for shadowing **Video BIOS** and designated regions of **option ROM** for improved performance. (System BIOS is always shadowed on your system.) To access the sub-menu, move the highlight cursor over the **Memory Shadow** option, and press the **ENTER** key. (For additional information on configuring this option, contact Packard Bell Technical Support.)

NOTE

Shadow ROM (System BIOS and Video ROM) are always enabled on your system. With System BIOS "shadowed," the computer copies the system BIOS into RAM, where it can be accessed faster, thus improving performance. With Video BIOS "shadowed," contents of the Video BIOS are copied into RAM for faster access. System BIOS occupies 64KB of RAM and Video BIOS occupies 32KB of RAM between 640KB and 1MB. However, 128KB of the remaining RAM between 640KB and 1MB are accessible by remapping 128KB to High Memory (the RAM above 1MB).

Boot Sequence

You can use the **Boot Sequence Sub-Menu** to select a disk drive boot sequence of Drive C: only, Drive A: before Drive C:, or Drive C: before Drive A:. You can also **customize** certain characteristics of the boot sequence (e.g**., Setup Prompt, POST Errors, Floppy Check** and **System configuration summary** screen) by selecting the appropriate option(s) from this Sub-Menu. (Highlight the **Boot Sequence** option, then press the **ENTER** key to access the Boot Sequence Sub-Menu.)

Numlock

The Keyboard Features Sub-Menu (which you can access by highlighting the Numlock option and pressing the **ENTER** key) includes settings for enabling or disabling the Numlock feature at system power on/off, and Keyclick enable.

Base Memory Size

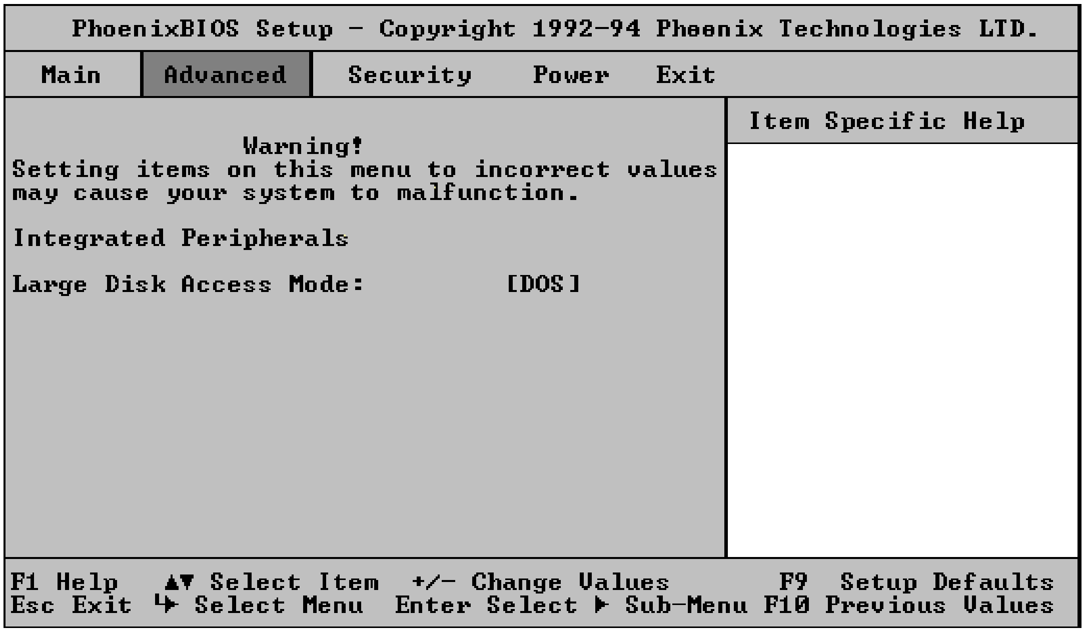
Your system's base memory size is fixed at 640 KB.

Extended Memory Size

The memory above base memory is set as extended memory. A portion of extended memory may be configured as expanded memory by adding a "Device=" statement in your CONFIG.SYS file. Contact Packard Bell Technical Support if you need assistance in configuring expanded memory using the EMM386.EXE device driver.

Advanced Setup Menu

To switch to the Advanced Setup Menu from the Main Setup Menu, press the Right Arrow (cursor) key.



```
                  Warning!
Setting items on this menu to incorrect values
may cause your system to malfunction.

Integrated Peripherals

Large Disk Access Mode:          [DOS]
```

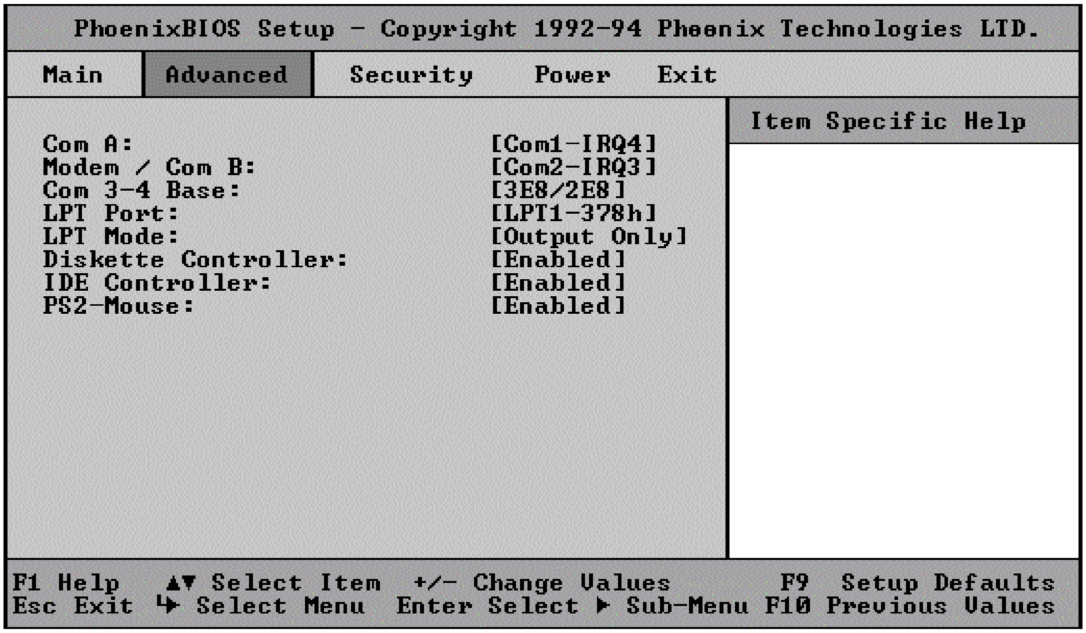
Figure 3-10: Advanced Setup Menu

WARNING! Items on the Advanced Setup Menu must be set correctly. Otherwise, an incorrect setting could cause the system to malfunction!

Plug and Play Configuration

Your system supports Plug and Play configuration software. Plug and Play simplifies system set up for you by detecting and identifying optional Plug and Play compatible adapter cards. Plug and Play also configures your system to work with these devices. Additionally, its ISA Configuration Utility helps you configure your system to use non-compatible ISA adapter cards.

NOTE You won't need to run the ISA Configuration Utility when installing Plus and Play-compatible adapter cards, because these cards are recognized and configured automatically. To install a non-compatible card (or to learn more about using the ISA Configuration Utility), see **Appendix H: ISA Configuration Utility**.



```
PhoenixBIOS Setup - Copyright 1992-94 Phoenix Technologies LTD.

Com A:                          [Com1-IRQ4]
Modem / Com B:                  [Com2-IRQ3]
Com 3-4 Base:                   [3E8/2E8]
LPT Port:                       [LPT1-378h]
LPT Mode:                       [Output Only]
Diskette Controller:            [Enabled]
IDE Controller:                 [Enabled]
PS2-Mouse:                      [Enabled]
```

Main
Advanced
Security
Power
Exit
Item Specific Help
F1 Help ▲▼ Select Item +/- Change Values F9 Setup Defaults
Esc Exit ↵ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Figure 3-11: Advanced Setup Sub-Menu

The following settings for Integrated Peripherals will be displayed in the Advanced Setup sub-menu (which you can access by highlighting the Integrated Peripherals option and pressing the **ENTER** key):

COM A	This setting can be set to COM1/IRQ4, COM4/IRQ3, COM3/IRQ4, **COM2/IRQ3 (default),** or Disabled. Be sure that the setting does not conflict with your Modem/COM B setting (discussed below).
Modem/ COM B	This setting can be set to COM2/IRQ3, COM4/IRQ3, COM3/IRQ4, **COM1/IRQ4 (default),** or Disabled. Be sure that the setting does not conflict with your COM A setting (discussed above).

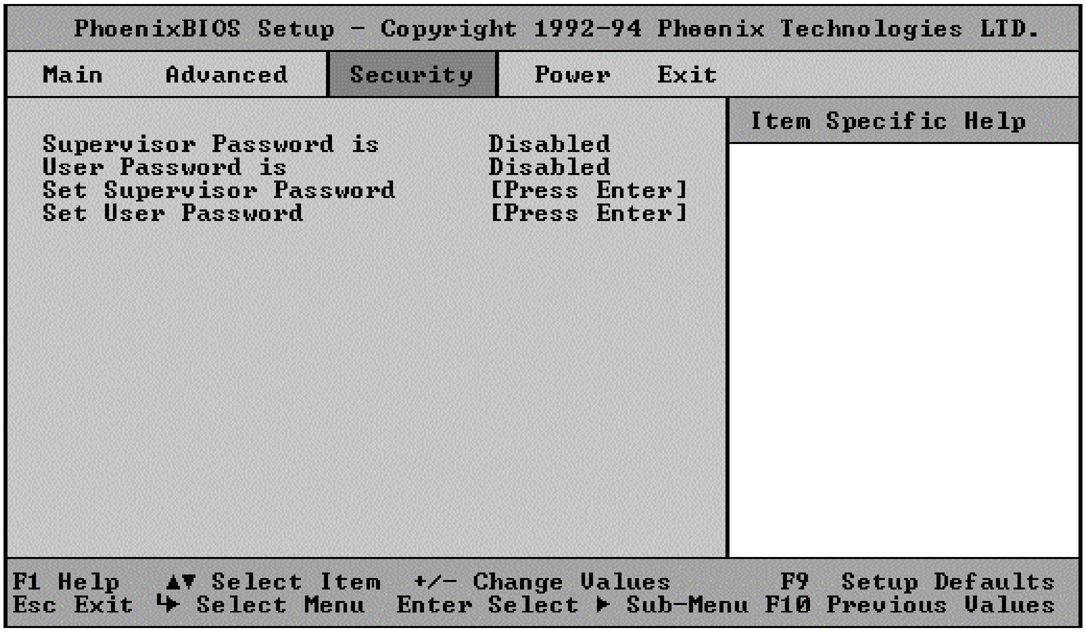
COM3/COM4 Base	This setting can be set to **3E8/2E8 (default),** 338/238, 220/228, or 2E8/2E0.
LPT Port	This setting selects the parallel port's address: **LPT1 (378h) (default),** LPT2 (278h), LPT3 (3BCh) or Disabled.
LPT Mode	This setting determines the parallel port's mode: **Output Only (default),** Bidirectional or ECP (Extended Capabilities Port).
Diskette Controller	This setting enables or disables the system's onboard floppy disk drive controller **(default=enabled).**
IDE Controller	This setting enables or disables the system's onboard hard disk drive (IDE) controllers (default=enabled).
PS/2 Mouse	This setting enables or disables the PS/2 Mouse Port on the system's rear panel (default=enabled).
Read Prefetch	This option lets the processor access information from the Local IDE Controller (OPTi 82C611A) at an accelerated rate **(default=enabled).** *(If you are running Windows NT, set this option to Disabled.)*
Large Disk DOS Compatibility	This setting should be default set to DOS if your system uses DOS. If you are using UNIX, Novell Netware or another operating system, select Other. If you are installing new software and the drive fails, change this setting and try again. Contact Packard Bell Technical Support if you need assistance.

NOTE

If you install a PCI Riser Card into your system, you'll need to upgrade your system's Setup Utility Program to support your PCI Riser Card. Contact Packard Bell Customer Service for information on obtaining the PCI BIOS Upgrade Kit. (If your system includes a PCI Riser Card, the upgrade should already be included in your system.) The PCI BIOS program is self-configuring, so you should not have to make configuration changes to support the PCI Riser Card.

Security Setup Menu

To enter the **Security** Setup menu from the Advanced Setup menu, press the **Right Arrow (cursor)** key. The menu will switch to the Security Setup menu, which displays the following settings:



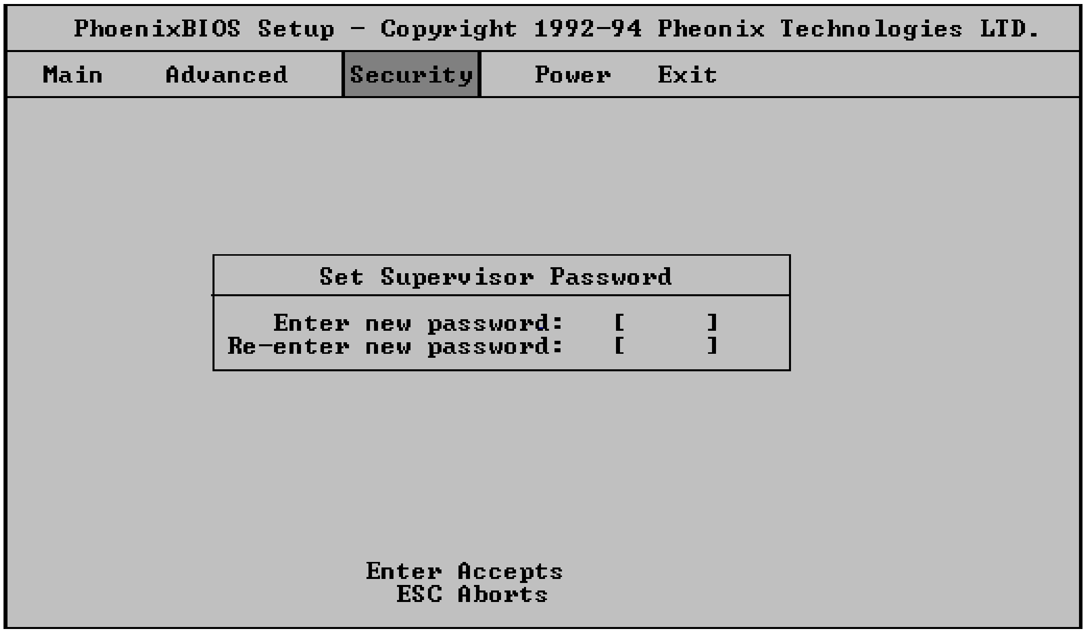
```
  PhoenixBIOS Setup - Copyright 1992-94 Phoenix Technologies LTD.
  Main    Advanced   Security   Power   Exit
                                                  Item Specific Help
  Supervisor Password is       Disabled
  User Password is             Disabled
  Set Supervisor Password      [Press Enter]
  Set User Password            [Press Enter]

F1 Help   ▲▼ Select Item  +/- Change Values       F9  Setup Defaults
Esc Exit  ↵ Select Menu  Enter Select ► Sub-Menu F10 Previous Values
```

Figure 3-12: Security Setup Menu

Password You can use the User Password feature to protect your system from unauthorized user access. (The Supervisor Password prevents your system BIOS against unauthorized access. The Supervisor password should also be used by a system administrator to override a forgotten User Password.) To set either Password:

1. Select either **Set User Password** or **Set Supervisor Password**. Press the **ENTER** key.

2. Enter a new User or Supervisor Password at the **Enter new Password** prompt. (**Be sure to enter your password carefully, because you won't be able to see any mistakes**.) Press the **ENTER** key to enter your password. (If you make a mistake, press **ESC** to abort the selection.)

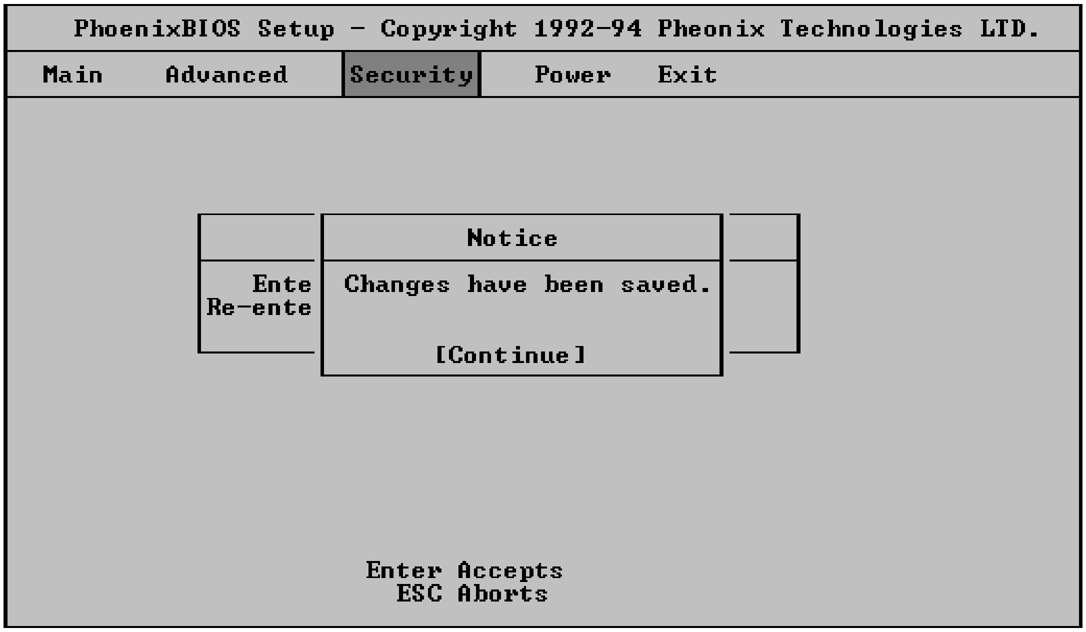

PhoenixBIOS Setup - Copyright 1992-94 Pheonix Technologies LTD.
Main
Advanced
Security
Power
Exit
Enter Accepts
ESC Aborts

```
          Set Supervisor Password

   Enter new password:    [      ]
Re-enter new password:    [      ]
```

Figure 3-13: Set Password Menu

3. Re-enter the New Password at the Re-enter prompt to confirm your selection. Press the **ENTER** key.

4. A dialog box will advise you that the changes have been saves. Press **ENTER** to continue



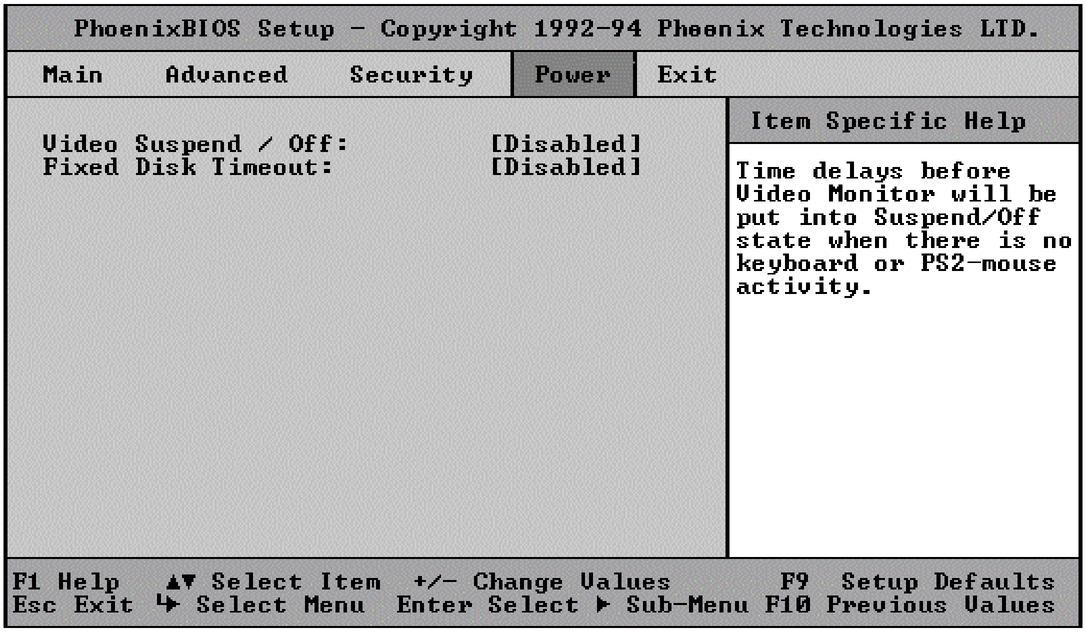
```
         Notice
Changes have been saved.
```

Figure 3-14: Password Confirmation Dialog Box

WARNING! Be sure to type your Password carefully when the system prompts you to do so, because you won't be able to see any of the characters you type, or any typing mistakes. **If you make a mistake, press ESC to abort the selection**. You can retype and enter your Password up to a total of (3) times. *If you do not enter the correct Password at this point, the system will automatically re-boot.* If you forget your Password, contact Packard Bell Technical Support for assistance.

Power Setup Menu

To enter the **Power** Setup menu from the Security Setup menu, press the **Right Arrow (cursor)** key. The menu will switch to the Power Setup menu, which displays the following settings:



```
   PhoenixBIOS Setup - Copyright 1992-94 Phoenix Technologies LTD.
  Main     Advanced     Security     Power    Exit

                                                Item Specific Help
  Video Suspend / Off:          [Disabled]
  Fixed Disk Timeout:           [Disabled]     Time delays before
                                               Video Monitor will be
                                               put into Suspend/Off
                                               state when there is no
                                               keyboard or PS2-mouse
                                               activity.

F1 Help   ▲▼ Select Item  +/- Change Values      F9  Setup Defaults
Esc Exit  ↵ Select Menu  Enter Select ▶ Sub-Menu F10 Previous Values
```

Figure 3-15: Power Setup Menu

Video Off

This option sets the Video Off mode. You can configure this feature for a time period of **120, 60, 20, 10, 5, 2, or 1 min**., or you can **Disable** it. If you don't use your keyboard or PS/2 mouse for the specified time period, the system enters **Off** mode.

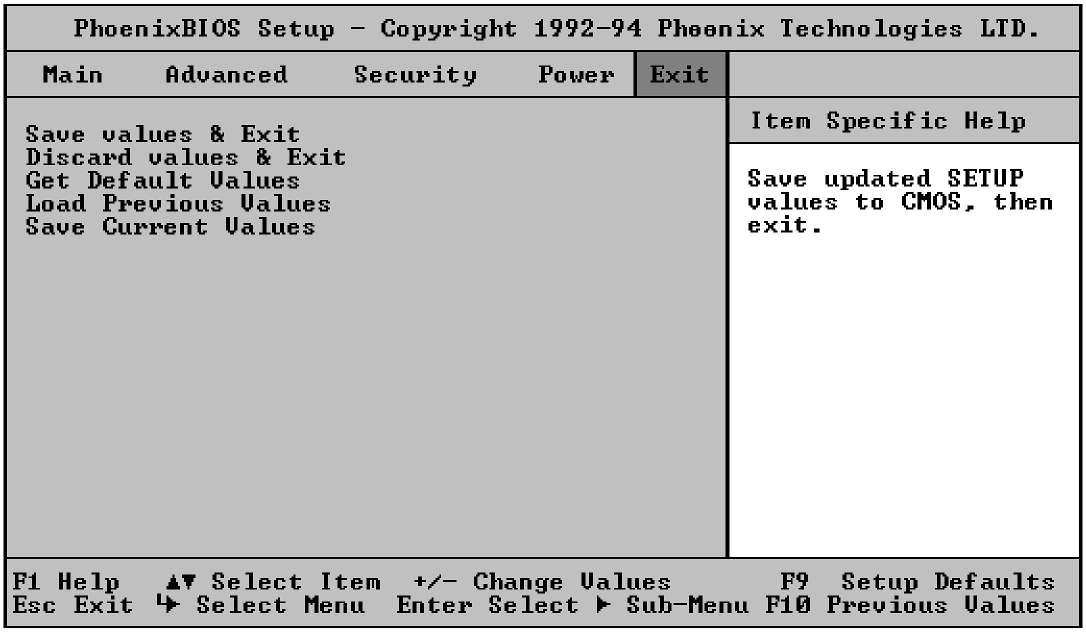
By enabling this feature, your monitor screen will "turn off" if you do not use the **keyboard** or **PS/2** mouse for the designated time period.

Fixed Disk Time Out

Your system has a hard disk drive power management feature that you can enable for a period of **16** minutes, or **disable (default).** Once enabled, the hard drive will "spin down" to standby mode if there is no hard drive activity for the specified time period. If you disable this feature, the hard drive will operate at full power.

Exit Menu

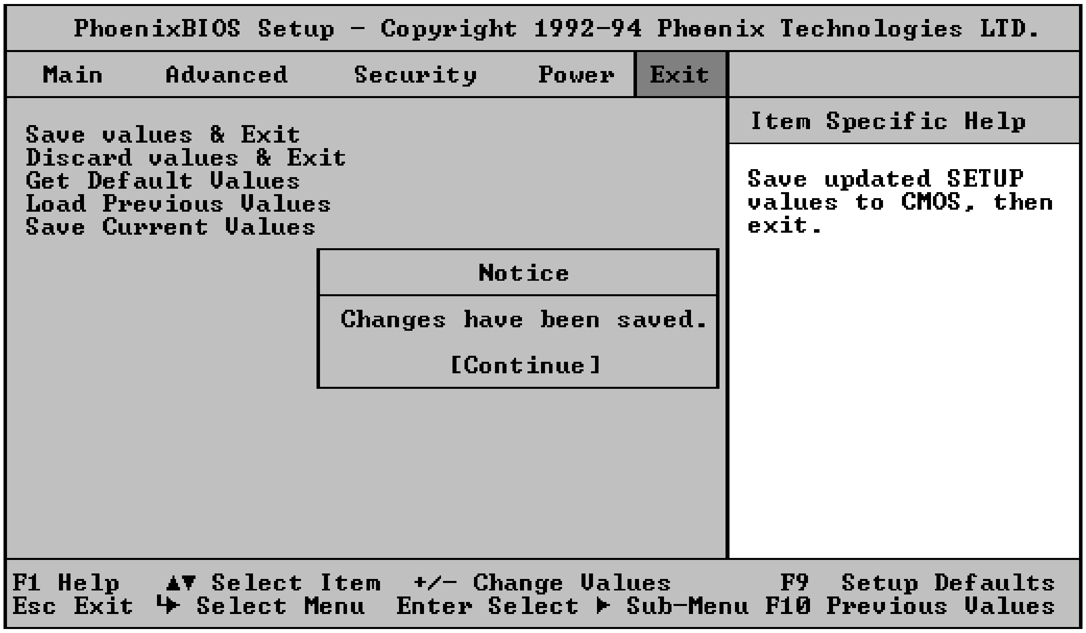
To move to the Exit Menu, press the Right Arrow (cursor) key to move the cursor over the Exit option. You will see the Exit menu shown in Figure 3-16.



```
  PhoenixBIOS Setup - Copyright 1992-94 Phoenix Technologies LTD.
  Main     Advanced     Security     Power    Exit

 Save values & Exit                          Item Specific Help
 Discard values & Exit
 Get Default Values                          Save updated SETUP
 Load Previous Values                        values to CMOS, then
 Save Current Values                         exit.

F1  Help   ▲▼ Select Item  +/- Change Values        F9  Setup Defaults
Esc Exit   ↔ Select Menu  Enter Select ▶ Sub-Menu F10 Previous Values
```

Figure 3-16: Setup Exit Menu

You can save the updated Setup values and exit, exit without saving values, use the system's default values, return to the previous values, or save the current values. Once you have made changes in the various menus, check to be sure that all settings are correct before you exit the Phoenix SETUP Utility. To implement the changes, select **Save Values & Exit**, then press **ENTER** twice. The SETUP program will save the changes, exit the Phoenix SETUP Utility, and reboot the system. The configuration changes specified are made in CMOS RAM and will take effect when the system is rebooted.



Save updated SETUP values to CMOS, then exit.

Changes have been saved.

Figure 3-17: Exiting Setup

NOTE

At this point, you should reboot the system. Run the Disk Image program (in Windows) to copy the DOS directory onto blank formatted floppy diskette(s). This is extremely important! For example, if you install a new unformatted hard drive in your system, you must use the DOS diskette(s) to access the DOS utilities (e.g., FDISK.EXE, FORMAT.COM). Save the backup diskettes for future use.

4

Putting Everything To Work

In this chapter, we'll show you how to put your computer system to use. You'll find out what the switches, controls and indicators are for, how you can use the keyboard more effectively, and how to use your disk drives.

System Components

Front Panel

There are some switches and indicators on the front panel of your computer (Figure 4-1). Their functions are explained below:

Power Button	The power button turns the main unit on and off.
Power Indicator	This indicator should be lit when the power is on.

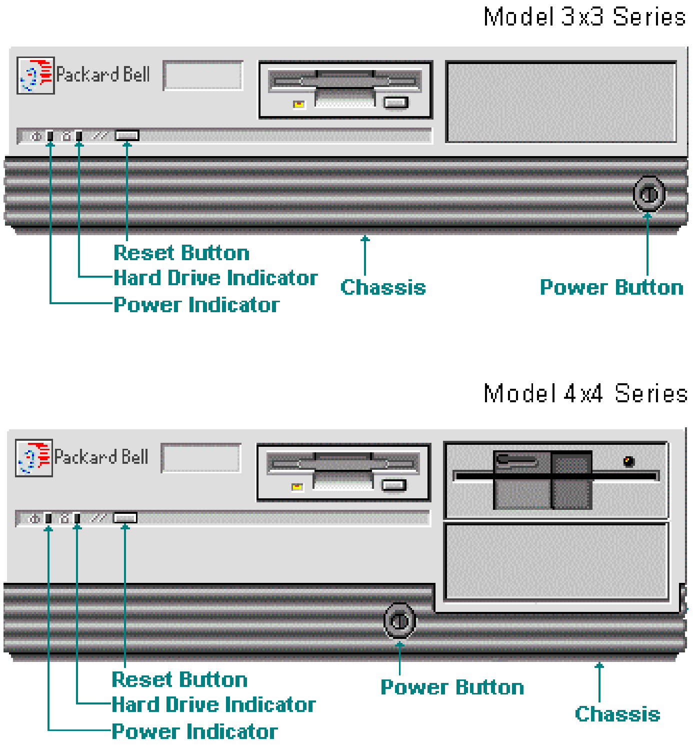


Figure 4-1: Front Panel Controls

Hard Disk Indicator	This indicator comes on when the system is reading data from, or writing data to, the hard disk.
Reset Button	To reset your system, press the reset button, located on the front panel next to the power and hard disk drive indicator lights.
WARNING!	**All data stored in the computer's electronic memory will be lost when you reset the system. Be sure to save your work to disk before resetting your system.**

Voltage Selector Switch

This switch is located in the back of the computer, and enables you to switch between 115V and 230V of power source. In the United States and Canada, most wall outlets are 120V (115V); in many European countries, the wall outlets are 220V (230V). **The switch should be set to the correct position at the factory before shipping. Be sure to check this setting before connecting your system to your power strip (surge protector) or grounded AC electrical outlet.**

WARNING! If the voltage selector is set improperly, serious damage to your system may result. If you are not sure what voltage you are getting from your power line, please call your electric company.

The Keyboard

Your computer system is equipped with a new enhanced PS/2-compatible keyboard with 101 or 102 keys, 12 function keys, a dual-mode numeric keypad, and separate cursor keys. The keyboard also has three indicator lights:

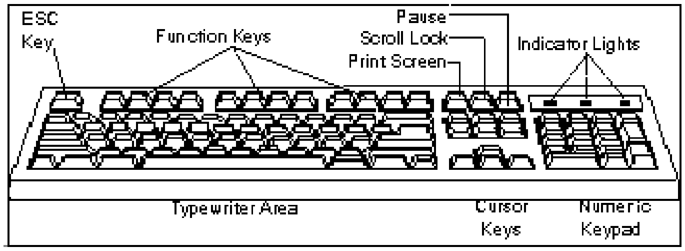


Figure 4-2: Keyboard

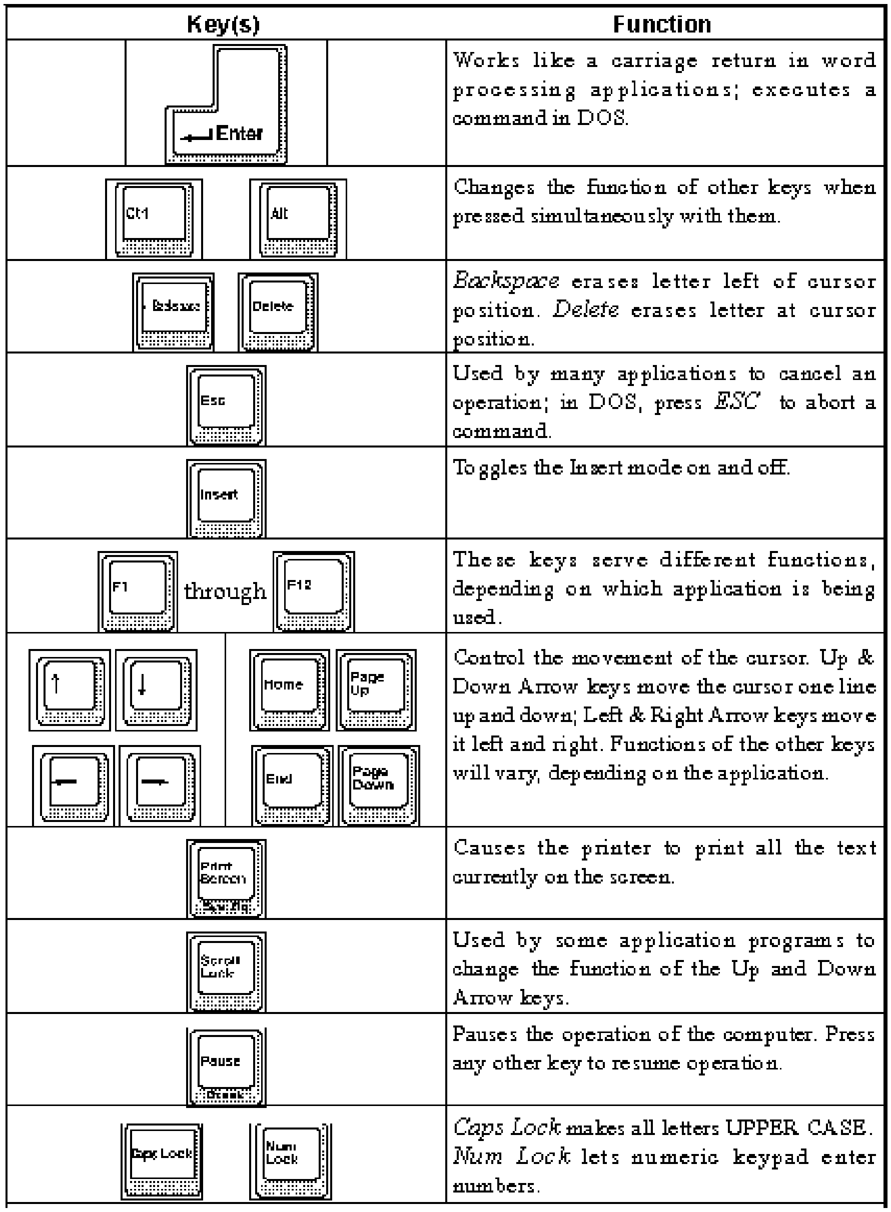
Caps Lock When this indicator is lit, every letter you type will be capitalized. However, the punctuation keys and the number keys in the top row will not be affected.

Num Lock When this indicator is lit, the numeric keypad can be used to enter numbers into the computer, much like an adding machine. When the indicator is unlit, the keypad can be used to move the cursor.

Scroll Lock When this indicator is lit, Scroll Lock is in effect. Some applications will move information across the screen differently when Scroll Lock is on.

For your convenience, the keys on the 101/102 Enhanced Keyboard are grouped into different areas, shown in Figure 4-2.

Typewriter Area	This area is comprised of keys found on a typical office typewriter, and in a similar arrangement. Some of the punctuation keys (such as "?" and "/") may be located differently from those on a typewriter.
Numeric Keypad	The Numeric Keypad lets you enter numeric data into applications such as spreadsheets and data bases. It includes the four arithmetic keys of "+" (addition), "-" (subtraction), "*" (multiplication) and "/" (division).
NOTE	The keypad will only enter numbers when the Num Lock indicator is lit.
Function Keys	There are 12 function keys on the top of your keyboard. These function keys serve different purposes in different programs. For example, the F1 key is often the HELP key in many application programs. The F3 key retypes your previous command at the DOS prompt. For details of what the function keys do, see the operation manual of the particular program, as well as your MS-DOS manual.
Special Keys	There is a group of special keys next to the numeric keypad. They are the Home, End, PgUp, PgDn, the four directional keys, etc. Their functions are included in Figure 4-3.



Key(s)	Function
Enter	Works like a carriage return in word processing applications; executes a command in DOS.
Ctl Alt	Changes the function of other keys when pressed simultaneously with them.
Bckspace Delete	*Backspace* erases letter left of cursor position. *Delete* erases letter at cursor position.
Esc	Used by many applications to cancel an operation; in DOS, press *ESC* to abort a command.
Insert	Toggles the Insert mode on and off.
F1 through F12	These keys serve different functions, depending on which application is being used.
↑ ↓ ← → Home Page Up End Page Down	Control the movement of the cursor. Up & Down Arrow keys move the cursor one line up and down; Left & Right Arrow keys move it left and right. Functions of the other keys will vary, depending on the application.
Print Screen SysRq	Causes the printer to print all the text currently on the screen.
Scroll Lock	Used by some application programs to change the function of the Up and Down Arrow keys.
Pause Break	Pauses the operation of the computer. Press any other key to resume operation.
Caps Lock Num Lock	*Caps Lock* makes all letters UPPER CASE. *Num Lock* lets numeric keypad enter numbers.

Figure 4-3: Keys and their functions

Floppy Disk Drives

Your computer system comes standard with a 3.5", 1.44 MB (2.88 MB optional) high density floppy disk drive (Drive A:), and may also be equipped with a 5.25", 1.2 MB, high density floppy disk drive (Drive B:). To use them:

- Insert your 3.5" disk into the A drive, with the labeled side facing UP, until it clicks into place.
- Insert a 5.25" disk CAREFULLY into the B drive with the labeled side UP, and secure it by turning the drive door (lever) 90 degrees clockwise.

The LED indicator on the drive(s) will light when the computer is reading data from, or writing data to, your diskettes.

WARNING! **Never remove a diskette from the drive while the LED is illuminated.**

There are several precautions you should take when using diskettes:

- Never touch the magnetic surface of your diskette.
- Never put the diskette near any type of magnet or magnetic field. Computer monitors, TV sets, and audio speakers emit magnetic fields that can erase your diskettes.
- Never leave your diskette in direct sunlight.
- Always store your 5.25" diskette in its protective sleeve.

Before you move your computer system, insert the Floppy Disk Drive Protector Card into your 5.25" 1.2 MB drive (optional), and close the drive door. Alternatively, you can substitute a blank 5.25" floppy diskette, if the Protector Card is not available.

A **floppy disk controller** is built into the motherboard of your computer system. If you want to use a separate floppy disk drive controller card, you must disable the built-in controller. To do so, change the SETUP Utility's **Diskette Controller** setting to **Disabled**. (This option is located in the Integrated Peripherals submenu. See the **Advanced Setup Menu** section, discussed in **Chapter 3: Setting Up**.)

WARNING! If you disable jumper (J20) I/O Controller Disable, your system's IDE controllers, parallel port and serial port(s) will also be disabled until you re-enable (J20) on the motherboard.

Hard Disk Drive

Most Packard Bell computer systems include a hard disk, which should already be installed and formatted. If not, or if you plan to install an additional hard disk, please refer to Hard Disk Installation, starting on **Chapter 5** and **Appendix A** for further guidance.

An IDE (AT) type **Hard Disk Controller (HDC)** has been built-in on the motherboard. Only an IDE (AT) type Hard Disk Drive (HDD) can be used in your computer system without installing a separate HDC card. If you want to use other kinds of HDDs (such as ESDI, SCSI), you must install a compatible ESDI card, SCSI card, or other kind of Disk Controller Card.

NOTE A separate Disk Controller Card may include a Floppy Disk Controller (FDC) and a Hard Disk Controller (HDC). While you're only interested in the HDC, the FDC is also activated. We suggest that you use both the HDC and FDC on the Card.

In order for your system to recognize the separate disk controller card, you may need to disable the **IDE Controllers. (This step is not necessary if you are using a SCSI or ESDI disk controller card.)** To do so, change the SETUP Utility's **IDE Controller** setting to **Disabled**. (This option is located in the Integrated Peripherals submenu. See the **Advanced Setup Menu** section, discussed in **Chapter 3: Setting Up**.)

WARNING! If you disable jumper (J20) I/O Controller Disable, your system's floppy disk controller, parallel port and serial port(s) will also be disabled until you re-enable (J20) on the motherboard.

5

Internal Installations

NOTE To install any of the following devices, it will be necessary to open your computer. Packard Bell recommends that installation of internal devices be performed by an Authorized Service Provider.

- Packard Bell Designer Color Panels
- Riser Card Upgrade
- Adapter Cards
- Disk Drives, CD ROM or Tape Back-up Drive
- Random Access Memory (RAM) upgrade
- Performance CPU Upgrade
- Cache Memory Upgrade
- Video Memory Upgrade
- Internal Modem

WARNING! Electro-Static Discharge (ESD) -- Before installing or touching any exposed printed circuit boards, computer parts, chips, etc., be sure that you are properly grounded. This is extremely important, as most internal computer components are highly susceptible to damage from Electro-Static Discharge (ESD).

Service technicians ground themselves by wearing an antistatic wrist strap (available at electronics supply stores) which is connected to an electrical ground (such as the serial port connector on your system's rear panel). If you do not have a wrist strap, you can ground yourself and dissipate any electro-static build-up by doing the following:

1. Connect the computer's power cord between the computer and a three pronged (grounded) electrical outlet.
2. Power to the computer must be turned OFF.
3. Touch, **and maintain continuous contact with**, an exposed metal surface of the computer system, such as the framing surrounding the disk drives, the metal surrounding the power supply or the unpainted part of the computer's rear panel, while handling or touching any internal components, chips, add-on boards or disk drives.

WARNING! Be sure to follow the internal installation instructions for your particular series system.

Step 3: SETUP, which begins on page 5-36, applies to both series.

Step 1: Removing & Restoring the Case

WARNING! If your system comes with a hard disk installed in the main unit, it will automatically self-park each time you shut down your computer's power.

To remove the case:

1. Use a screwdriver to remove the three cover mounting screws located on the computer's rear panel, as shown in **Figure 5-1** or **5-2**.

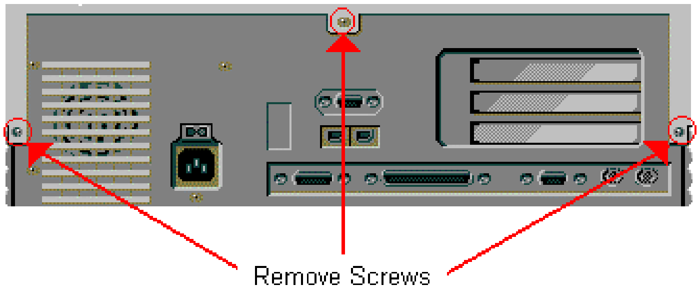


Figure 5-1: Rear Panel Model 3x3 Series

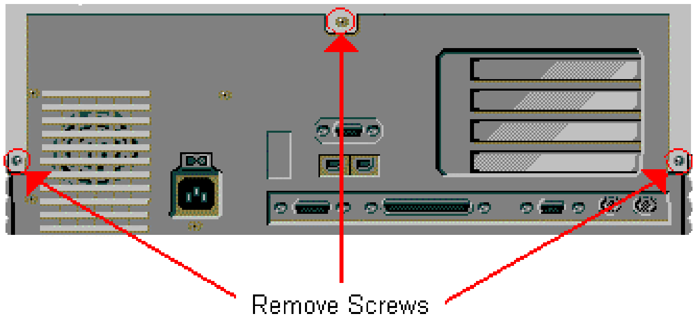


Figure 5-2: Rear Panel Model 4x4 Series

2. Slide the cover toward the rear of the chassis a few inches, then grasp the sides of the cover (near the front of the chassis) and swing it up toward you (Figure 5-3). Lift the cover off the system carefully and set it aside.

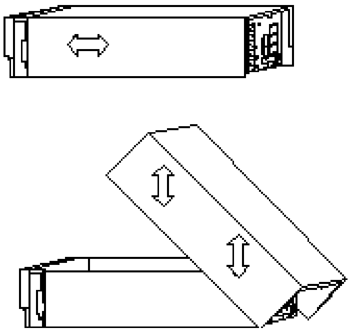


Figure 5-3: Removing or Restoring the Cover

To restore the case:

1. Avoid damaging your system - before restoring the cover, make sure no cables or other devices are accidentally sticking out of the chassis.

NOTE If you have previously removed the front bezel panel, be sure to fasten it securely to the chassis' front panel *before* restoring the cover. *The front bezel panel must be securely connected to the chassis before you restore the cover*.

2. Start by lowering the cover's rear section onto the rear section of the chassis, then lower the front section down over the chassis. Leave room to slide the cover forward (Figure 5-3).
3. Slide the cover forward until its front edge slides under the edge of the front panel bezel. The cover and front panel bezel should fit squarely together.
4. Secure the case with the three cover mounting screws that you removed from the chassis' rear panel earlier (**Figure 5-1** or **5-2**).

Step 2: Installing Devices

Follow the guidelines in this section for the appropriate category:

- Packard Bell Color Accent Panels -- Change the look of your system by switching the color panels of your chassis.
- **Riser Card Upgrade** -- Upgrade an ISA Riser Card to an optional PCI Riser Card.
- **Adapter Cards** -- This may be an optional PCI add-in card, a graphics adapter card, a bus card for a bus mouse or an internal modem.
- **CD-ROM, Disk Drive or Tape Backup System --** Add or change a disk drive, or add a CD-ROM drive or Tape Backup system.
- **Memory (RAM) Upgrade --** On-board memory upgrade using SIMMs (Single In-line Memory Modules).
- **Performance CPU upgrade.**
- **Cache Memory Upgrade.**
- **Video Memory upgrade.**
- **Internal Modem** -- Follow the Adapter Card procedure.

NOTE To install a **CD-ROM Drive, Tape Back-Up Drive or Second Serial Port**, see the documentation included with these items for information. You can install only one of these options into your system. If necessary, contact Packard Bell Technical Support for assistance.

WARNING! If your system includes a CD-ROM drive, or if you install one, locate the system horizontally on a table or desktop. Do not stand the unit vertically on its side (e.g., in a computer stand).

Figure D-1 in **Appendix D** shows the organization of your motherboard. Refer to this figure for the locations of connectors and jumpers.

Color Accent Panels

To add a personal touch to your Packard Bell computer system, you can customize its appearance by changing the color accent panels on the chassis! For information on available color options, contact Packard Bell Customer Service.

To remove the **lower front panel:**

Model 3x3 Series Place your thumbs on the lower (colored) front designer panel, just below the Power and Hard Disk Drive indicator lamps (on the left side), and just left of the power button (on the right side). (See **Figure 5-4A**.)

Model 4x4 Series Place your thumbs on the lower (colored) front designer panel, just below the Power and Hard Disk Drive indicator lamps (on the left side), and to the right of the power button (on the right side). (See **Figure 5-5A**.)

1. Press both thumbs firmly against the lower colored front panel to ensure a good grip.

2. Pull the panel down away from the chassis with your thumbs. Note the "tabs" on top of and inside the panel. Save this panel for future use.

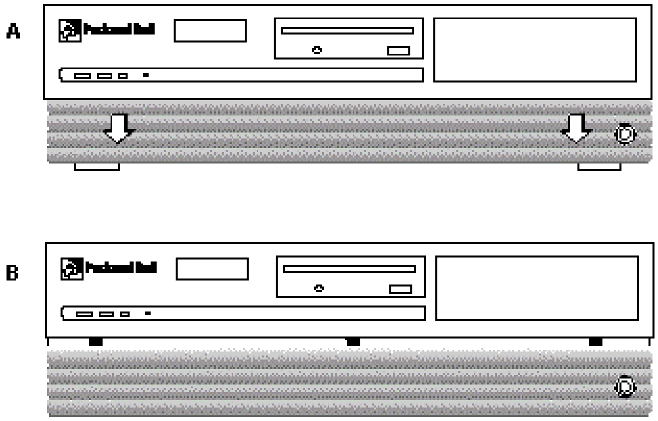


Figure 5-4: Removing/Installing Model 3x3 Front Designer Color Panel

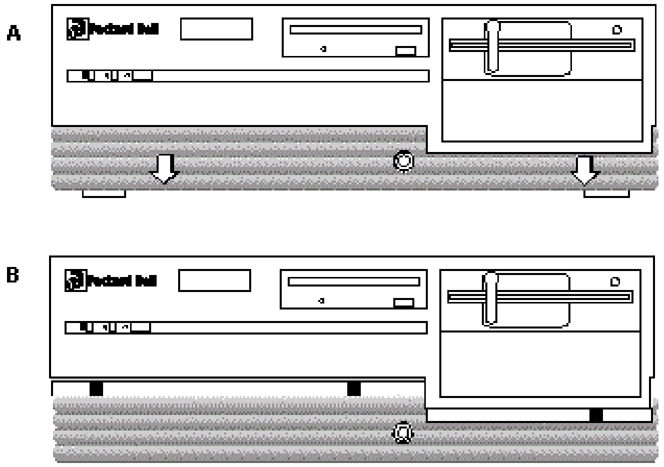


Figure 5-5: Removing/Installing Model 4x4 Front Designer Color Panel

3. To install a different colored front panel (or reinstall your original panel), carefully set the panel's tabs into the chassis' slots (Figure 5-4B or 5-5B).

4. Use your thumbs to slide the panel up "into" the chassis, similar to the way that you removed it (above). It should snap into place.

To change the lower side panels:

1. If you haven't already done so, remove the case from the chassis (see **Step 1: Removing & Restoring the Case** earlier in this chapter). Place the case upside down on your lap so that you can see the case's interior metal shell. Each side panel has three colored tabs that are set into slots in the metal shell. The panels are also secured to the shell's four metal tabs, that fit into grooves on the panel's lower edge (See Figure 5-6).

2. Place your hands on both ends of one of the lower side panels. Be sure to hold the metal shell securely on your lap.

3. Press your fingers firmly against the outside of the colored panel. (Your thumbs should be pressed against the inside of the metal shell.) Slide the panel sideways with your fingers until you can see all three colored tabs in the wide end of the slots (Figure 5-6).

4. Carefully remove the panel from the chassis; save it for future use. (Repeat Steps 2-4 with the other panel.)

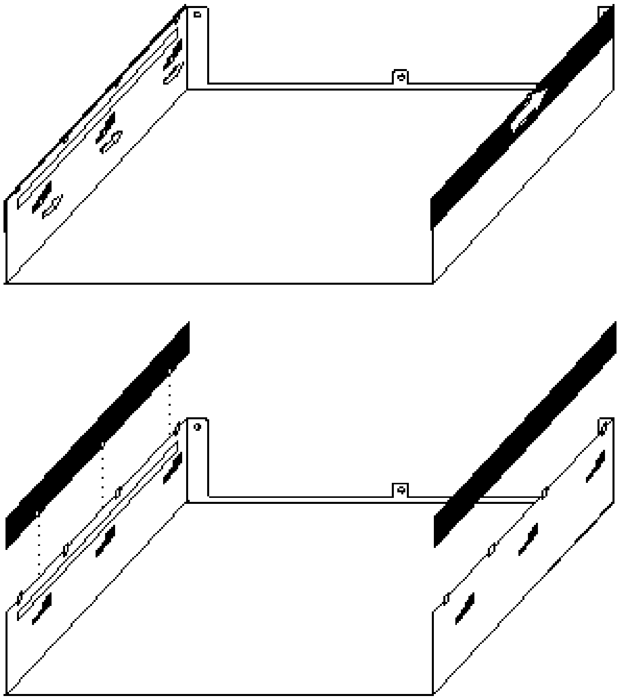


Figure 5-6: Releasing/Securing Side Designer Color Panels

5. To install new (or reinstall your original) side panels, start with the vented panel first. Slide its three colored tabs into the wide end of the slots on the vented side of the case.

6. Gently press the panel so that it sits flat against the metal shell, with the shell's four metal tabs inserted into the grooves on the panel's lower edge. **Don't force it.** If you have difficulty, remove the panel and reinsert it.

7. Slide the panel with your fingers until you see all three tabs in the thin end of the slots. The panel should fit tightly against the metal shell. (If it doesn't, carefully reverse the procedure

until you can remove the panel, and try again.)

8. Repeat the procedure with the other panel. Restore the case when you are finished (see **Step 1: Removing & Restoring the Case** for details).

NOTE **To ensure proper heat dissipation, be sure to install the vented panel on the vented side of the case.**

Riser Card Upgrade

You have the option to change your system's ISA riser card to a PCI Riser Card for improved performance.

NOTE

If you install a PCI Riser Card into your system, you'll need to upgrade your system's Setup Utility program to support your PCI Riser Card. Contact Packard Bell Customer Service for information on obtaining the PCI BIOS Upgrade Kit. (If your system includes a PCI Riser Card, the upgrade should be included in your system, so you can skip this section.) The PCI BIOS Program is self-configuring, so you shouldn't have to make configuration changes to support your PCI Riser Card.

To install the PCI Riser Card:

1. Use a screwdriver to remove the drive mounting tray's two anchoring screws (located at the top left center and top right front corner of the tray). Set the screws aside. Slide the tray back a few inches. At this point, you should be able to lift the tray out of the chassis.

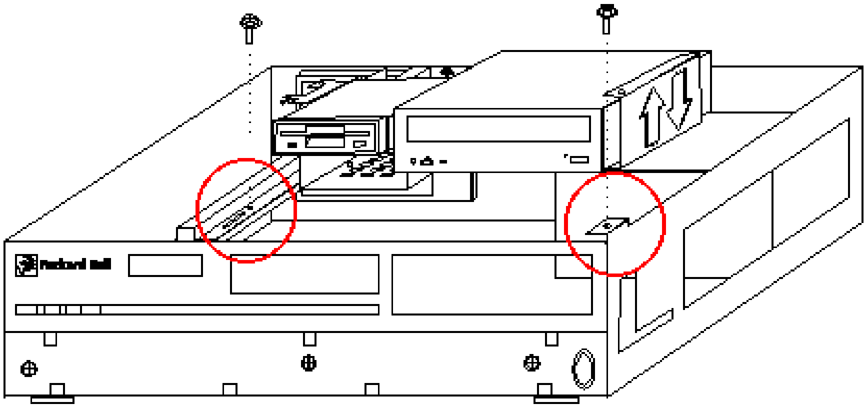


Figure 5-7: Model 3x3 Drive Mounting Tray Anchor Screws

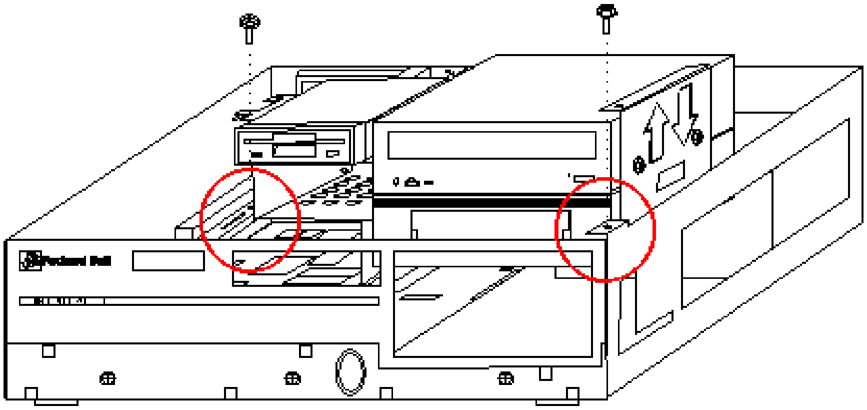


Figure 5-8: Model 4x4 Drive Mounting Tray Anchor Screws

WARNING! If you already have one or more device(s) installed in the mounting tray, be careful when working around their power supply cable and/or data cable connections as you remove the tray from the chassis. If necessary, disconnect these cables from the device (as discussed in **Disk Drives, CD-ROM and Tape Backup Systems**, later in this chapter). Be sure to note the orientation of the cable connector to the device connector, and the power cable connector's label (e.g., PA, PB).

NOTE **Be careful when working around the Riser Card. It is fragile!**

2. Remove any Adapter Card(s) that may be installed in your system's riser card expansion slot(s). See **Adapter Cards** (later in this chapter) for instructions.

3. Unscrew the Riser Card support bar's anchor screw from your system. (The support bar runs the length of the system. The anchor screw is located **on top** of the chassis' rear panel above the expansion slots.) Once you have removed it, carefully lift this end of the support bar up from the top edge of your system's riser card **about 1/2 inch** and move the support bar **clockwise 30 to 45 degrees**. At this point, the support bar should become unhooked from the other end of the system. Set the support bar and its anchor screw aside.

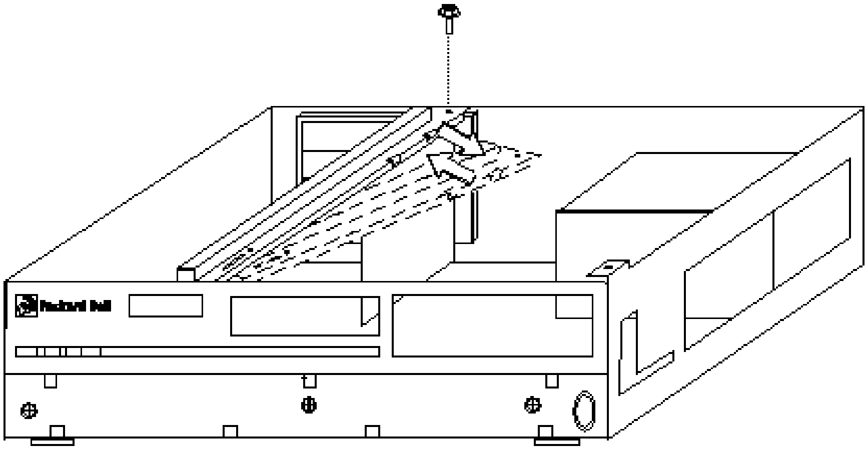


Figure 5-9: Removing/Installing Riser Card Support Bar (Model 3x3 Series)

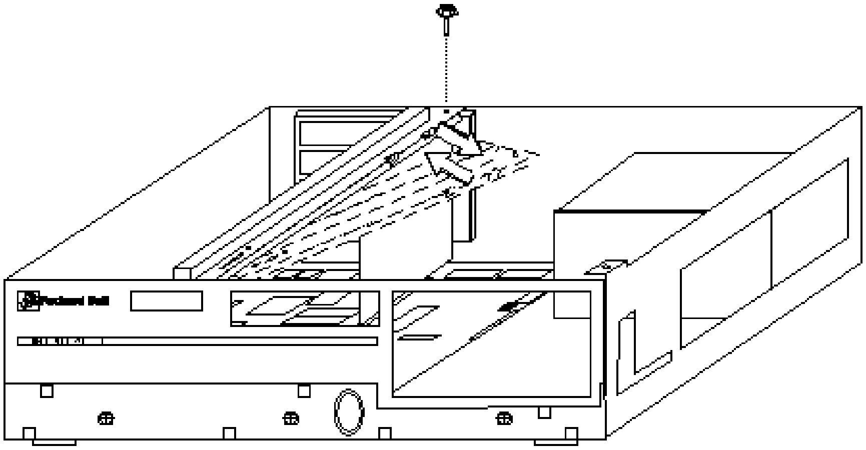


Figure 5-10: Removing/Restoring Riser Card Support Bar (Model 4x4 Series)

4. **Be careful not to touch any integrated circuits or connectors on the motherboard**. Press your thumb and forefinger at the base of the Riser Card Connectors (J12) and (J27) on the motherboard. Use your other hand to firmly grasp the top edge of the Riser Card **closest to the chassis' rear panel**.

5. Pull the Riser Card firmly out of the Riser Card connector on the motherboard (See Figure 5-11 or 5-11). **Handle the card by its top edges - don't touch the gold "metal fingers" that insert into the Riser Card Connector**. Store the old card inside an antistatic bag (available from electronics supply stores) to guard against damage from electrostatic discharge.

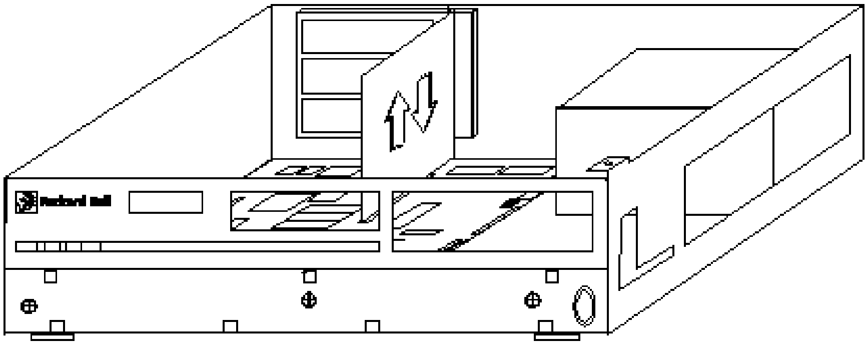


Figure 5-11: Removing/Installing Riser Card (Model 3x3 Series)

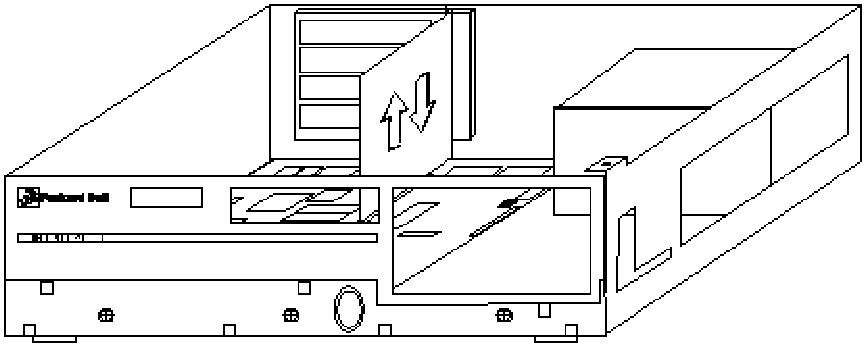


Figure 5-12: Removing/Installing Riser Card (Model 4x4 Series)

6. Remove the PCI Riser Card from its antistatic bag, handling it by its top edges - **don't touch the gold "metal fingers" that insert into the Riser Card Connector** .

7. Be careful not to touch any integrated circuits or connectors on the motherboard. Press your thumb and forefinger at the base of the Riser Card Connector (J12) and (J27) on the motherboard. Carefully insert the card into the Riser Card connector with your other hand by pressing on its top edge, closest to the chassis' rear panel (See Figure 5-11 or 5-12). **The Riser Card must sit squarely in the connectors. Then remove the jumper from (J33) on the motherboard**. (See **Figure D-1** in Appendix D for location.)

8. Replace the riser card support bar by inserting its hooked end into the twin slots (located **inside** the front panel of the chassis, next to the front fan bay). Move the support bar counterclockwise 30 to 45 degrees until it is parallel with your Riser Card (See **Figure 5-9** or **5-10**). Lower the support bar onto the Riser Card until the support bar's built-in braces fit snugly over the Riser Card's top edge.

9. Secure the support bar to the top of the chassis' rear panel by restoring its anchor screw above the system's expansion slots.

10. Restore the drive mounting tray by reversing the procedure you used in Step 1 (above).

11. Before installing PCI adapter cards into your system, you must use the PCI BIOS Update program (which should be included with your PCI Riser Card Upgrade Kit) to update your system's BIOS. For details, see **Chapter 3: Setting Up**. (If your system includes a PCI Riser Card, the PCI BIOS Upgrade program should be installed in the system. Because the program is self-configuring, you shouldn't have to change the configuration.)

12. After completing installation and PCI BIOS Upgrade, you can reconnect your ISA (AT-compatible) cards to your riser card's available ISA connectors, or install PCI compatible adapter cards into your riser card's available PCI connectors (discussed below). Contact Packard Bell Technical Support for information about PCI Adapter Card availability.

Adapter Cards

There are several expansion slots on your system's rear panel for the Riser Card, which is installed on the motherboard. **(Model 3x3 Series** systems feature 3 expansion slots, while **Model 4x4 Series** systems feature 4 expansion slots.) *Depending on the system you purchased, your riser card may feature one of the following configuration options:*

For Model 3x3 Series:

- Each of the expansion slots may feature **ISA (AT-compatible) 16-bit connectors, each with long and short receptacles. You can install an ISA (AT-compatible) 8-bit or 16-bit adapter card into any of these slots.**

OR

- Each of the top two slots may feature a **PCI connector**, with **the second (lower) slot sharing an ISA (AT-compatible) 16-bit connector. In this configuration, the two lowest slots feature ISA (AT-compatible) 16-bit connectors**. Accordingly, you can install a **PCI adapter card** in either of the **top two slots**, while an **ISA (AT-compatible) 8-bit or 16-bit card** can be installed in either of the **two lowest slots**. (One expansion slot shares ISA and PCI connectors.)

For Model 4x4 Series:

- Each of the expansion slots may feature ISA (AT-compatible) 16-bit **connectors**, each with long and short receptacles. You can install an ISA (AT-compatible) 8-bit or 16-bit adapter card into any of these slots.

OR

- Each of the **top two slots** may feature a **PCI connector**, with the **second (lower) slot sharing an ISA (AT-compatible) 16-bit connector**. In this configuration, the two lowest slots also feature ISA (AT-compatible) 16-bit connectors. Accordingly, you can install a PCI adapter card in either of the top two slots, while an ISA (AT-compatible) 8-bit or 16-bit card can be installed in any of the three lowest slots. (One expansion slot shares ISA and PCI connectors.)

NOTE **The lowest expansion slot accommodates a half-size adapter card. Do not install a full-size card in this slot.**

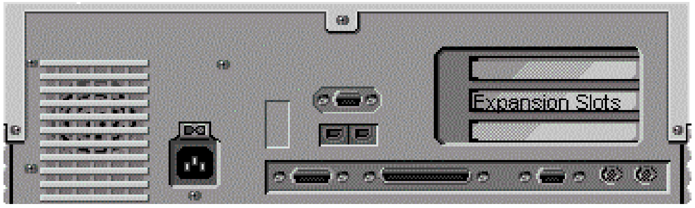


Figure 5-13: Expansion Slots (Model 3x3 Series)

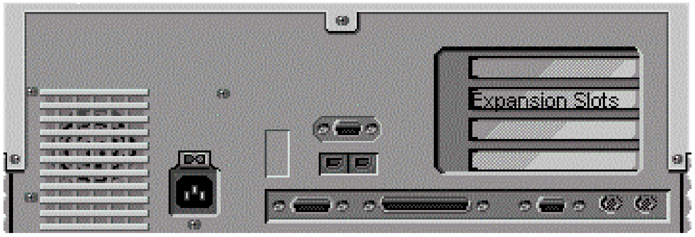


Figure 5-14: Expansion Slots (Model 4x4 Series)

To install an adapter card:

1. Choose the slot that you want to install your adapter card into. Remove the expansion slot cover's anchor screw, located on the side of the expansion slot cover.
2. Refer to the adapter card's user's manual for any switches or jumpers on the adapter card that need to be set, and set them now
3. Carefully, but firmly, press your adapter card into the riser card's PCI (short) or ISA (long) connector. If your adapter card is full-length, make sure that you mount it in the proper supporting bracket at the front end of the computer.
4. Secure your adapter card into the expansion slot with the slot cover's anchor screw (that you removed in Step 1). Save the expansion slot cover for future use
5. If your adapter card's user's manual indicates that you may need to change a jumper setting on your computer's motherboard, refer to Appendix D for the location and function of the jumpers.
6. Restore the case (see **Step 1: Removing & Restoring the Case** earlier in this chapter).

To remove an Adapter Card from your system:

1. Remove the anchor screw that secures the card to the expansion slot (from Step 4 above).

2. Don't touch the connectors on the card - handle it only by its edges, to avoid damage from electrostatic discharge. Carefully "unplug" your adapter card from the riser card and remove it from its expansion slot.

3. Store the card in an antistatic bag (available from electronics supply stores).

Peripheral Bay Panels (Front Bezel)

To remove the **peripheral bay panel(s)** on the front bezel to access your optional floppy disk drive, CD-ROM drive or other peripheral device:

1. Follow the front color accent panel removal procedure (**Page 5-5**).

2. Unscrew the anchor screws, located on the front bezel panel below the Power and Hard Disk Drive indicator lamps (on the left side) and adjacent to the electric power switch (on the right side). **If your system includes a third anchor screw (located below the 3.5" bay on the front bezel), remove this screw as well.**

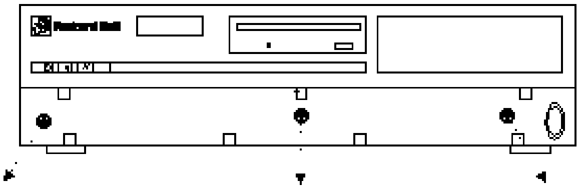


Figure 5-15: Front Bezel Anchor Screws (Model 3x3 Series)

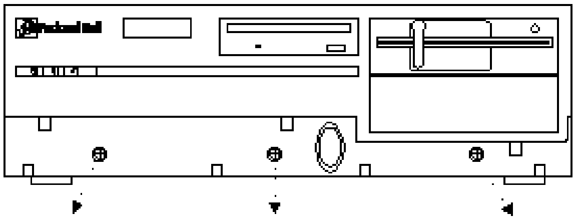


Figure 5-16: Front Bezel Anchor Screws (Model 4x4 Series)

3. Carefully slide the front bezel panel down and away from the chassis. Turn it over so that you can see its backside.

4. The removable peripheral bay panels are "locked" in place by flexible tabs on either side of the panels. To remove a bay panel, pull one of the tabs inward (toward the center of the panel). At the same time, push the panel outward, toward the outside of the bezel. Save the panel for future use.

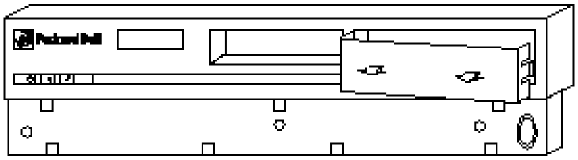


Figure 5-17: Removing/Inserting Peripheral Bay Panel (Model 3x3 Series)

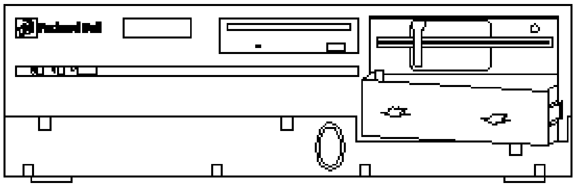


Figure 5-18: Removing/Inserting Peripheral Bay Panel (Model 4x4 Series)

5. Your system's accessible 5.25" peripheral bay may be enclosed by a metal plate. To remove the plate, press against it with your fingertips and "twist" it forward or backward until it breaks away from the chassis. **Be careful of sharp edges!** At this point, you can access your peripheral device through the front panel.

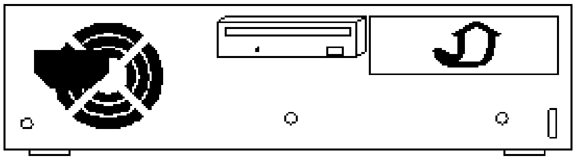


Figure 5-19: Removing Metal Plate (Model 3x3 Series)

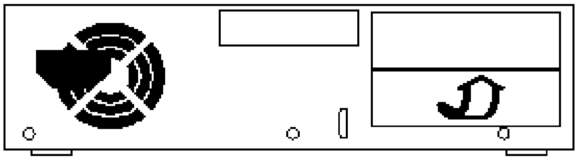


Figure 5-20: Removing Metal Plate (Model 4x4 Series)

To reinstall the front bezel panel that you removed in Step 3:

1. Set the panel's tabs into the chassis' slots.

2. Slide the panel up and "into" the chassis. Secure the panel with the anchor screws that you removed in Step 2 (above).

Disk Drives, CD-ROM and Tape Back Up

Model 3x3 Series

Your computer features three half-height bays for disk drives or other devices, as shown in Figure 5-21. The top center and top right bays are accessible from outside the system; the center bottom (enclosed) bay is only available for an optional 3.5" hard disk drive. The top center bay holds the standard 3.5" floppy disk drive included with your system (Drive A:). The top right bay may contain an optional 5.25" floppy disk drive (Drive B:), if one is included with your system. If this bay is unoccupied, you may install a 5.25" disk drive (hard or floppy), a CD-ROM drive, or tape backup system.

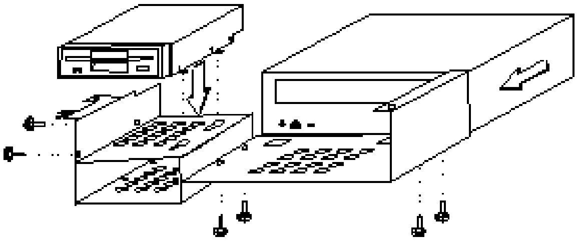


Figure 5-21: Model 3x3 Series Drive Bays

Model 4x4 Series

Your computer features four half-height bays for disk drives or other devices, as shown in Figure 5-22. The top center, top right, and bottom right bays are accessible from outside the system; the center bottom (enclosed) bay is only available for an optional 3.5" hard disk drive. The top center bay holds the standard 3.5" floppy disk drive included with your system (Drive A:). The top right bay may contain an optional 5.25" floppy disk drive (Drive B:), if one is included with your system. If this bay is unoccupied, you may install a 5.25" disk drive (hard or floppy). The bottom right bay can accommodate a second 5.25" device. If this bay is unoccupied, you may install a 5.25" disk drive (hard or floppy), a CD-ROM drive, or tape backup system.

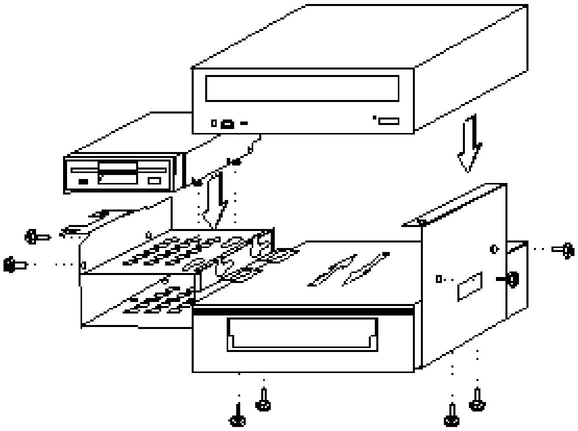


Figure 5-22: Model 4x4 Series Drive Bays

Any unoccupied bays may have removable peripheral bay panels, which release from behind the front bezel, and snap into place in the front of the chassis. (See the previous section for details.)

NOTE Your system's floppy controller will support up to two floppy drives.

The installation procedure for a **hard disk drive, CD-ROM drive** or **tape backup system** is listed below. The installation procedure for a **floppy disk drive** (discussed later in this section) is similar, except that you won't need to change the setting of any jumpers. However, you must remove the front bezel's peripheral bay panel to access the drive. (See the Floppy Disk Drive Installation section for information.)

WARNING! If your system includes a CD-ROM drive, or if you install one, locate the system horizontally on a table or desktop. Do not stand the unit vertically on its side (e.g., in a computer stand).

3.5" Hard Disk Drive Installation

Your system features two IDE (Integrated Drive Electronics) connectors built into the motherboard, allowing you to install IDE type hard disk drives: a **Local Bus IDE connector** located at **(J24)**, and a **standard IDE connector** located at **(J23)** on the motherboard. SCSI type hard disk drives are also supported; however, they require a separate controller card. See **Adapter Cards** in this chapter for information on installing a SCSI controller card.

Important! Your system can boot up from the (primary) Local Bus IDE Connector 0, located at (J24) on your motherboard, rather than the (secondary) IDE Connector 1, located at (J23). When adding a hard disk drive to your system, be sure to connect your primary master (C:\) drive to (J24).

To install a 3.5" hard disk drive (HDD):

1. Use a screwdriver to remove the drive mounting tray's anchoring screws (located at the top left center and top right front corner of the tray; an optional third screw may be included on the tray's right side). Set the screws aside. Slide the tray back a few inches. At this point, you should be able to lift the tray out of the chassis. (See **Figure 5-7** or **5-8**.)

WARNING! If you already have one or more device(s) installed in the mounting tray, be careful when working around its power supply cable and/or data cable connections as you remove the tray from the chassis. If necessary, disconnect these cables from the device and remove the device from the tray (discussed below). Be sure to note the orientation of the cable connector to the device connector, and the power cable connector's label (e.g., PA, PC).

2. Set the drive select jumper on the hard disk drive to either "Master" or "Slave." See your IDE Hard Disk Drive documentation for details.

3. Slide the 3.5" hard disk drive (HDD) into the mounting tray's lower 3.5" HDD bay. Secure the drive with four screws that match up to the bay's (and hard drive's) mounting holes on the bottom side of the tray. (See Figure 5-23 or 5-24.) Then return the mounting tray (with the 3.5" HDD attached) to the chassis. Secure the tray to the chassis with the anchoring screws that you removed in Step 1.

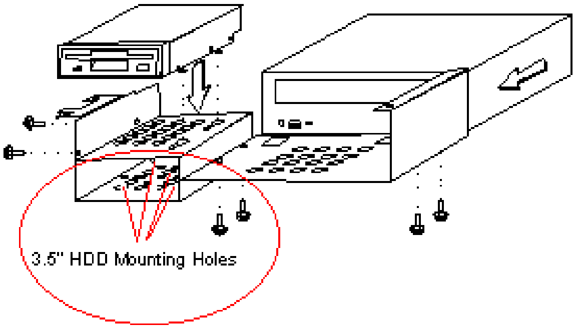
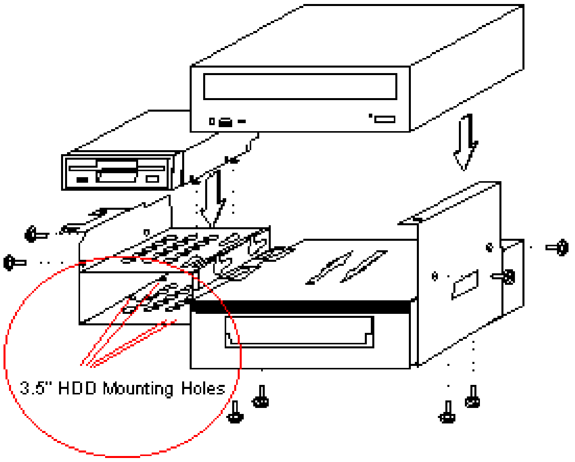


Figure 5-23: Model 3x3 3.5" HDD Mounting Holes



4. Connect the four-line power cable from the system's power supply to the disk drive's power receptacle. Your disk drive will not function without this connection. This four-hole female-type connector may be labeled **PA, PB or PC**. The cable connector's rounded edges should be facing up toward you as you connect it to the disk drive's four-pin male receptacle.

5. Connect your IDE HDD to your system's motherboard with the 40-pin IDE cable bundled in the system. The small end of the cable should be connected to either the primary **(J24) Local Bus IDE connector** or secondary **(J23) standard IDE connector** on your system's motherboard. ***Your primary master (C:\) drive should be connected to (J24).*** Carefully connect the large end of the data cable to the drive, but **don't force it**. If it doesn't connect squarely, try reversing the connector's orientation. It is designed to connect to the drive in only one way. (Align the red stripe of the cable with Pin 1 on the drive's cable connector.)

NOTE

If you are adding a SCSI hard disk drive, connect its control cable to Pin 1 on the drive's cable connector and to the optional controller card. Check the documentation that came with the drive for any special cable routing instructions. (If you haven't installed the controller card, do so now. See **Adapter Cards** in this chapter for instructions.)

6. Now, go to **Step 3: SETUP** to set up your 3.5" HDD.

5.25" Device Installation

If a 5.25" device was not installed in your system, you'll need to remove the front bezel's 5.25" Peripheral Bay Panel in order to access your 5.25" CD-ROM or Tape Backup Drive. For instructions on how to do this, see **Peripheral Bay Panels (Front Bezel) earlier in this chapter.**

To install a **5.25" hard disk drive** (HDD)**, CD-ROM drive or tape backup system:**

1. Use a screwdriver to remove the drive mounting tray's two anchoring screws (located at the top left center and top right front corner of the tray; an optional third screw may be included on the tray's right side). Set the screws aside. Slide the tray back a few inches. At this point, you should be able to lift the tray out of the chassis. (See **Figure 5-7** or **5-8**.)

WARNING! If you already have one or more device(s) installed in the mounting tray, be careful when working around their power supply cable and/or data cable connections as you remove the tray from the chassis. If necessary, disconnect these cables from the device and remove the device from the tray (discussed below). Be sure to note the orientation of the cable connector to the device connector, and the power cable connector's label (e.g., PA, PB).

NOTE Some devices may require a configuration or cable routing that differs from the following procedure. Check the documentation included with your device for information. If you are installing a SCSI device, you must first install a **SCSI controller card**. For information on how to do this, see the **Adapter Cards** section of this chapter

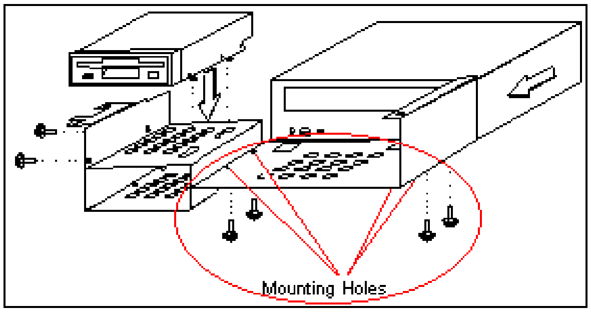


Figure 5-25: Model 3x3 5.25" Device Mounting Holes

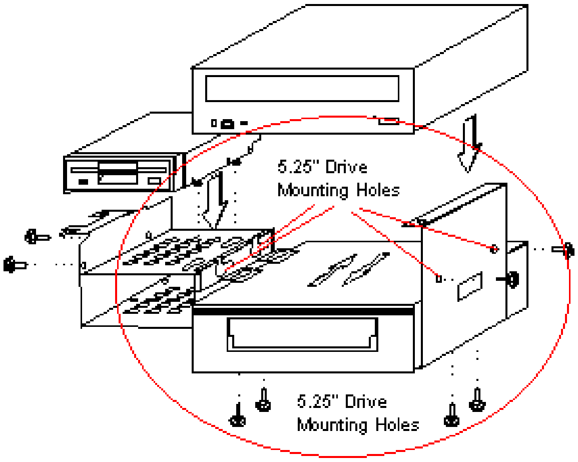


Figure 5-26: Model 4x4 5.25" Device Mounting Holes

2. Set the drive select jumper on the hard disk drive. Refer to your IDE Hard Disk Drive User's Manual for details.

3. Slide the 5.25" hard disk drive into the drive mounting tray's 5.25" half-height bay. Secure the drive to the tray's four mounting holes (located on the bottom side of the tray) with the drive's anchoring screws. (See Figure **5-25** or **5-26**.) Then secure the tray to the chassis with the anchoring screws that you removed in Step 1.

4. Connect a four-line power cable from the system's power supply to the disk drive's power receptacle. Your disk drive will not function without this connection. This four-hole female-type cable connector may be labeled **PA, PB, or PC**. The connector's rounded edges should be facing up toward you as you connect it to the disk drive's four-pin male receptacle.

5. Connect the drive to your motherboard with the 40-pin IDE cable (bundled in the system). The small end of the cable should be connected to either the **(J24) Local Bus IDE connector or (J23) standard IDE connector** on your motherboard. ***Your primary master (C:\) drive should be connected to (J24).*** Carefully connect the large end of the data cable to the drive, but **don't force it.** If it doesn't fit, try reversing the connector's orientation. It is designed to connect to the drive in only one way. (Align the red stripe of the cable with Pin 1 on the drive's cable connector.)

NOTE If you are adding a **CD-ROM or SCSI Tape Backup drive**, connect its control cable to the optional controller card. (If you've installed a sound card in your system, connect the CD-ROM Drive's control cable to the sound card instead of the CD-ROM drive's controller card.) Either card should be installed in one of your system's expansion slots. (See **Adapter Cards** in this chapter for instructions.)

Important! Model 4x4 Series systems: To add a second 5.25" drive, you may need to replace your system's **40-pin single connector cable** with a **40-pin dual connector cable** *(available from your hard drive dealer.)* The large connector on the end of the cable should be for your first drive, while the connector in the middle of the cable should be for your second drive. The small connector on the other end of the cable connects to either the (J24) Primary Local Bus IDE Connector or (J23) Secondary ISA IDE Connector on your motherboard. ***Note that your primary master (C:\) drive should be connected to (J24).***

6. Now, go to **Step 3: SETUP** to set up your 5.25" device.

Floppy Disk Drive Installation

To install a 3.5" Floppy Disk Drive (FDD):

1. Use a screwdriver to remove the drive mounting tray's anchoring screws (located at the top left center and top right front corner of the tray; an optional third screw may be included on the tray's right side). Set the screws aside. Slide the tray back a few inches. At this point, you should be able to lift the tray out of the chassis. (See Figure 5-7 or 5-8.)

WARNING! If you already have one or more device(s) installed in the mounting tray, be careful when working around their power supply cable and/or data cable connections as you remove the tray from the chassis. If necessary, disconnect these cables from the device and remove the device from the tray (discussed below). Be sure to note the orientation of the cable the tray (discussed below). Be sure to note the orientation of the cable connector to the device connector, and the power cable connector's label (e.g., PA, PB).

2. Secure the 3.5" FDD into the 3.5" FDD bay by matching the floppy drive's four anchoring screws to the mounting holes located on the top and left side of the 3.5" bay. (See Figure **5-27** or **5-28**.) Then return the mounting tray (with the 3.5" FDD attached) to the chassis. Secure the tray to the chassis with the anchoring screws that you removed in Step 1.

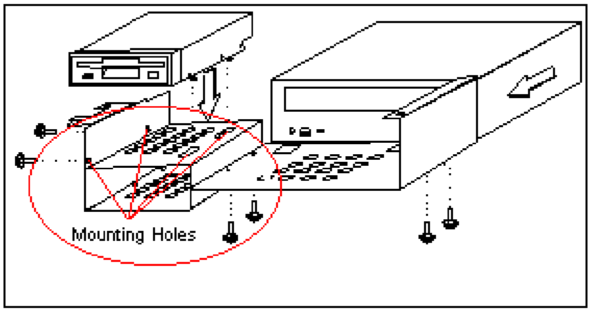


Figure 5-27: Model 3x3 3.5" FDD Mounting Holes

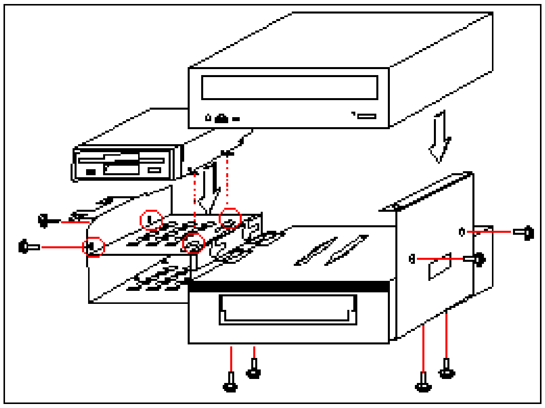


Figure 5-28: Model 4x4 3.5" FDD Mounting Holes

NOTE

Some devices include pan screws, which install part-way into a drive's mounting hole. These screws slide into the mounting tray's "keyhole-shaped" mounting holes for a secure fit.

3. Connect the four-line power cable from the system's power supply to the disk drive's power receptacle. Your disk drive will not function without this connection. (This female-type cable connector is smaller than the others, and may be labeled **PD**.) *The connector's "teeth" should be facing up toward you as you connect the cable to the drive.*

4. Connect your FDD to your system's motherboard with the wide 34-pin Daisy Chained cable bundled in the system. One end of the cable should be connected to the **Floppy Disk Connector** (labeled **J21)** on your system's motherboard. *This cable features two connectors: the end connector is reserved for your first drive, and the middle connector is reserved for your second drive.* Carefully connect the desired connector to the drive, **but don't force it.** If it doesn't fit cleanly, try reversing the connector's orientation. It is designed to connect to the drive in only one way. (The red edge of the cable is Line 1; it must be matched to the drive's connector.)

5. Now, go to **Step 3: SETUP** to set up your 3.5" FDD.

To install a 5.25" Floppy Disk Drive (FDD):

1. Use a screwdriver to remove the drive mounting tray's anchoring screws (located at the top left center and top right front corner of the tray; an optional third screw may be included on the tray's right side). Set the screws aside. Slide the tray back a few inches. At this point, you should be able to lift the tray out of the chassis. (See **Figure 5-7** or **5-8**.)

NOTE If a 5.25" device was not installed in your system, you'll need to remove the front bezel's 5.25" Peripheral Bay Panel in order to access your 5.25" floppy drive. For instructions on how to do this, see **Peripheral Bay Panels (Front Bezel)** earlier in this chapter.

WARNING! If you already have one or more device(s) installed in the mounting tray, be careful when working around their power supply cable and/or data cable connections as you remove the tray from the chassis. If necessary, disconnect these cables from the device and remove the device from the tray (discussed below). Be sure to note the orientation of their power supply cable and/or data cable connections as you remove the tray from the chassis. If necessary, disconnect these cables from the device and remove the device from the tray (discussed below). Be sure to note the orientation of the cable connector to the device connector, and the power cable connector's label (e.g., PA, PB).

2. Secure the 5.25" FDD into the 5.25" FDD bay by matching the floppy drive's four anchoring screws to the four mounting holes located on the bottom of the 5.25" bay. (See **Figure 5-25** or **5-26**.) Then return the mounting tray (with the 5.25" FDD attached) to the chassis. Secure the tray to the chassis with the anchoring screws that you removed in Step 1.

3. Connect the four-line power cable from the system's power supply to the disk drive's power receptacle. Your disk drive will not function without this connection. This four-hole female-type cable connector may be labeled **PA, PB or PC**. The connector's rounded edges should be facing up toward you as you connect it to the disk drive's four pin male receptacle.

4. Connect your FDD to your system's motherboard with the wide 34-pin Daisy Chained cable bundled in the system. One end of the cable should be connected to the **(J21) Floppy Disk Connector** on your system's motherboard. *This cable features two connectors: the end connector is reserved for your first drive, and the middle connector is reserved for your second drive.* Carefully connect the desired connector to the drive, but **don't force it**. If it doesn't fit cleanly, try reversing the connector's orientation. It is designed to connect to the drive in only one way. (The red edge of the cable is Line 1; it must be matched to the drive's connector.)

5. Now, go to **Step 3: SETUP** to set up your FDD.

Memory Upgrade

Your computer system comes with 4MB of onboard RAM (Random Access Memory) located at (U60), (U61), (U62), (U63), (U67), (U68), (U69), and (U70). Two 72-pin SIMM sockets are located at (U66) and (U73) on your system's motherboard. To add additional memory to your system:

1. You can install 72 pin SIMMs (Single In-line Memory Module) into the motherboard's SIMM Sockets, depending on the amount of memory you want to upgrade to.

2. You must use SIMMs with an access time equal to or faster than 80 ns (nanoseconds).

3. The module will fit into the socket in only one way. To install the SIMM module(s), make sure that the module's notch is aligned with the left side of the SIMM socket.

4. Insert the module's metal fingers into the socket's grooved slot on a 45 degree angle. Grasp the module on both ends and carefully "rock" (rotate) it toward you until it **stands straight up, and "clicks" into place on both ends of the socket**. (See Figure 5-29.)

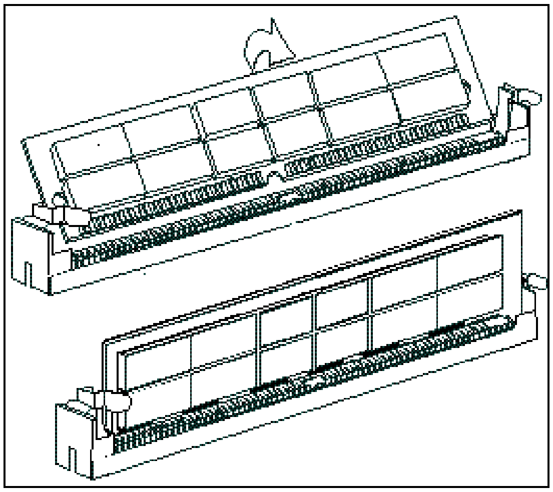


Figure 5-29: Installing SIMMs

5. The memory configuration options appear in Tables 5-1 and 5-2.

6. After you have installed the memory modules, go to **Step3: SETUP** to set up your new memory configuration.

Important! You can purchase memory upgrades **with parity** (e.g., 1Mx36, 4Mx36) or **without parity** (e.g., 1Mx32, 4Mx32). The memory upgrade configurations are identical for both types of memory.

To use the parity feature:

- You must change the setting of **(J18) Parity Enable** on the motherboard by removing the jumper from pins 2-3 and placing it over pins 1-2. (See **Figure D-1 in Appendix D** for the location of (J18) on the motherboard.)
- You must **disable your system's onboard memory** (Surface-Mounted DRAM) by placing a jumper over **(J37) Onboard DRAM Disable**. (See **Figure D-1 in Appendix D**for the location of (J37) on the motherboard.)
- Install the memory upgrade (with parity) in accordance with the amounts shown in **Table 5-2: Memory Configurations (No Onboard Memory Enabled).**

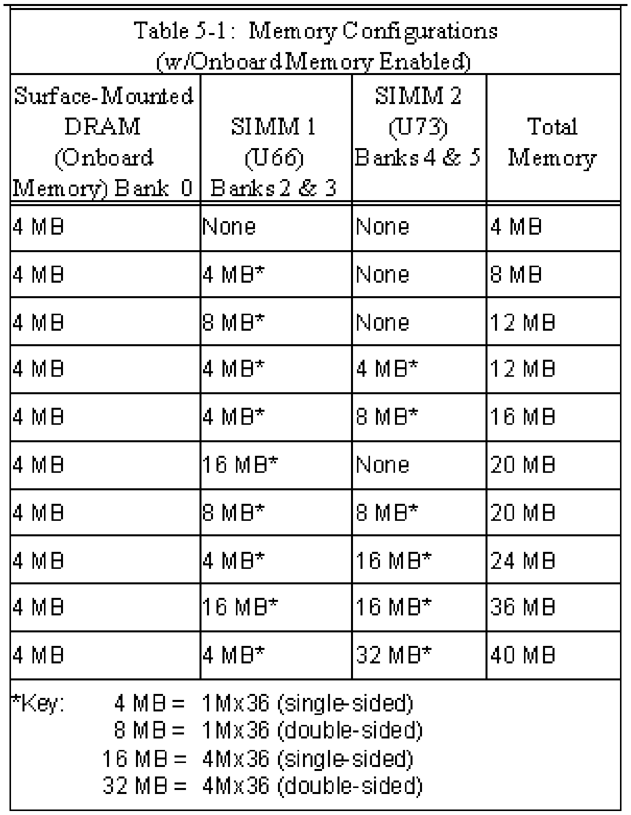


Table 5-1: Memory Configurations (w/Onboard Memory Enabled)

Surface-Mounted DRAM (Onboard Memory) Bank 0	SIMM 1 (U66) Banks 2 & 3	SIMM 2 (U73) Banks 4 & 5	Total Memory
4 MB	None	None	4 MB
4 MB	4 MB*	None	8 MB
4 MB	8 MB*	None	12 MB
4 MB	4 MB*	4 MB*	12 MB
4 MB	4 MB*	8 MB*	16 MB
4 MB	16 MB*	None	20 MB
4 MB	8 MB*	8 MB*	20 MB
4 MB	4 MB*	16 MB*	24 MB
4 MB	16 MB*	16 MB*	36 MB
4 MB	4 MB*	32 MB*	40 MB

*Key:
4 MB = 1Mx36 (single-sided)
8 MB = 1Mx36 (double-sided)
16 MB = 4Mx36 (single-sided)
32 MB = 4Mx36 (double-sided)

NOTE If a 5.25" device was not installed in your system, you'll need to remove the front bezel's 5.25" Peripheral Bay Panel in order to access your 5.25" floppy drive. For instructions on how to do this, see **Peripheral Bay Panels (Front Bezel)** earlier in this chapter.

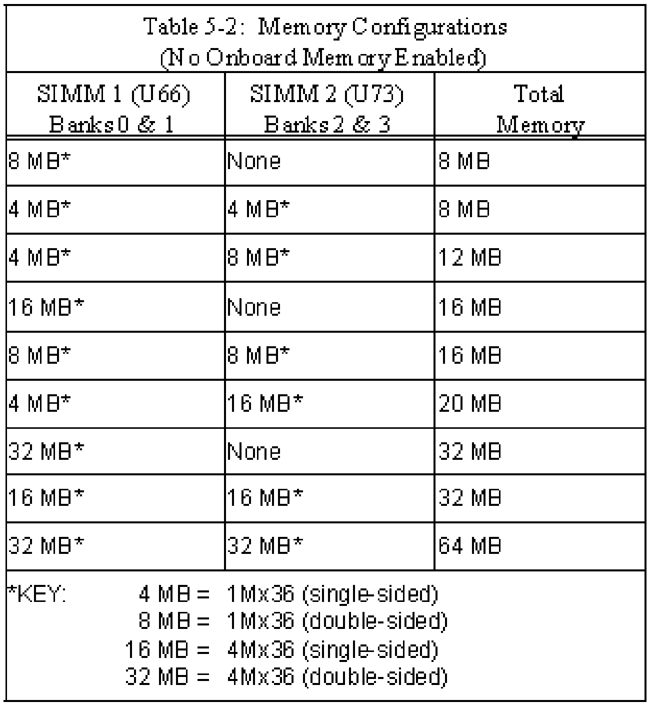


Table 5-2: Memory Configurations
(No Onboard Memory Enabled)

SIMM 1 (U66) Banks 0 & 1	SIMM 2 (U73) Banks 2 & 3	Total Memory
8 MB*	None	8 MB
4 MB*	4 MB*	8 MB
4 MB*	8 MB*	12 MB
16 MB*	None	16 MB
8 MB*	8 MB*	16 MB
4 MB*	16 MB*	20 MB
32 MB*	None	32 MB
16 MB*	16 MB*	32 MB
32 MB*	32 MB*	64 MB

*KEY:
4 MB = 1Mx36 (single-sided)
8 MB = 1Mx36 (double-sided)
16 MB = 4Mx36 (single-sided)
32 MB = 4Mx36 (double-sided)

Performance CPU Upgrade

NOTE For information on upgrade processor availability for your system, contact Packard Bell Technical Support.

486SX/ 486DX Systems You may upgrade your computer system to twice the internal CPU processing speed by adding an optional OverDrive™ upgrade processor.

486SX2/ 486DX2 Systems You may upgrade your system to take advantage of the Pentium OverDrive processor. The Pentium OverDrive processor uses Intel's Pentium processor technology to provide improvement in Integer calculations and Floating Point calculations over SX2 and DX2 system performance.

SL Enhanced For additional power-saving capability, you can install Intel's SL Enhanced microprocessors.

Installing the CPU Upgrade

1. The upgrade processor must be installed in the ZIF (Zero Insertion Force) socket (U50), making sure that the orientation of the chip is correct. To install the upgrade:

   Release the locking bar from the side of the ZIF socket (U50), and carefully raise it straight up, until the socket slides open. (If you are replacing a processor which is currently installed in this socket, carefully pull the processorout of the socket, taking care not to bend any pins. Set the old processor aside.)

   The upgrade processor has a dot located on the upper right beveled corner of the chip's nameplate. This beveled corner should be aligned so that it faces the corresponding upper right beveled corner of the ZIF upgrade socket on the motherboard. Be sure to align the upgrade processor carefully, depending on whether you're installing an OverDrive processor or a Pentium OverDrive processor.

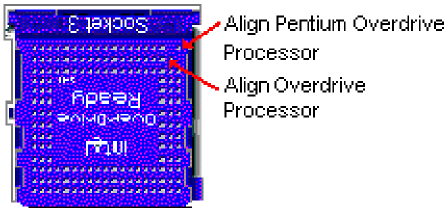


Figure 5-30: CPU Upgrade Socket

2. Carefully insert the upgrade processor into the ZIF socket, taking care to align the chip's beveled corner with the socket's beveled corner. Lower the socket's locking bar and secure it against the side of the socket.

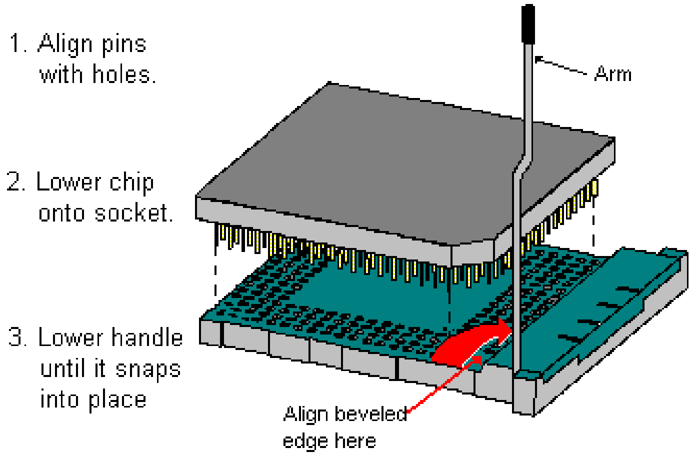


Figure 5-31: Installing the Upgrade Processor

3. Depending on the type of CPU you're upgrading to, you may need to change the following jumper settings on the motherboard:

   - If you're upgrading a **486SX PGA**-type processor installed in your CPU upgrade socket **(U50),** place jumpers over pins **1-2** and **3-4**, and remove the jumper from pins **5-6**, of **(J31) - CPU SX Type Processor**. **If you're upgrading a PQFP-type 486SX processor (located at (U48) on your motherboard) or another processor type, you don't need to change this setting.**

   - If you're upgrading to a **Pentium OverDrive** processor from a 486SX PGA-type processor (mounted at (U50) in your motherboard's CPU Upgrade Socket), remove the jumper from pins **5-6** and place jumpers over pins **1-2** and **3-4** of **(J31)** - CPU SX Type Processor. **(You don't need to change this setting if you're upgrading from a 486 SX PQFP-type processor (located at (U48) on your motherboard).**

   - If you're upgrading from a standard CPU (instead of an SL-Enhanced CPU), remove the jumper from pins 2-3 and place it over pins 1-2 of **(J28) - Pentium OverDrive or SL Enhanced Processor Reset Control**. (Note: To change from the Pentium OverDrive processor to another processor type, you may need to restore jumpers (J28) and (J31) to their original settings, depending on the processor type. See Appendix D for information.)

   - If your CPU Upgrade processor runs at a different clock speed, you may need to change the setting for jumper **(J25) - CPU Speed Select**. Place the jumper over pins **1-2** for **25 MHz** speed, or pins **2-3** for **33 MHz** speed.

   - For jumper **(J32) - CPU Voltage,** place a jumper over pins **1-3** and **2-4** if you're using a **3.3 volt CPU**, or pins **3-5** and **4-6** for a **5 volt CPU**. See Appendix D for the tables of these jumper settings.

After installation, restore the case and secure it with the three cover mounting screws.

You do not need to go to STEP 3: Setup following installation of the CPU Upgrade, since this will be done automatically.

Cache Memory Upgrade

Your 486 computer comes with 8 KB of internal cache onboard. You can add external cache SRAM chips totaling 128 or 512 KB to improve system performance. Contact your computer dealer regarding availability of SRAM chips. **When adding external cache, install the chip so that the notch on the top of the chip matches the chip outlines on the motherboard.**

128K Cache Upgrade

1. Obtain (4) 32Kx8 (20ns), (1) 32Kx8 (15ns) and (1) 64Kx1 (15ns) cache SRAM chips.
2. Be careful to align the pins over the socket holes. Carefully press the single 32Kx8 (15ns) chip into socket (U55). The single 64Kx1 (15ns) chip should be installed into socket (U58). The remaining (4) 32Kx8 (20ns) chips should be installed in sockets (U16), (U19), (U25) and (U32). (See Figure 5-32.)

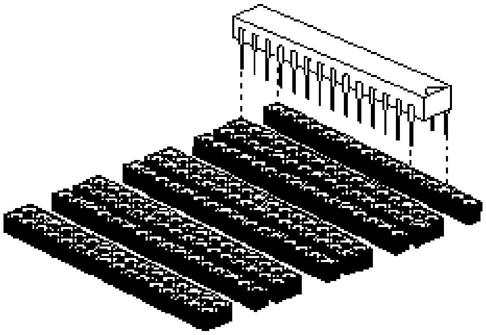


Figure 5-32: Installing 32K Cache Chip

512K Cache Upgrade

1. Obtain (4) 128Kx8 (20ns), (1) 32Kx8 (15ns) and (1) 64Kx1 (15ns) cache SRAM chips.

2. Be careful to align the pins over the socket holes. Carefully press the single 32Kx8 (15ns) chip into socket (U55). The single 64Kx1 (15ns) chip should be installed into socket (U58). The remaining (4) 128Kx8 (20ns) chips should be installed in sockets (U16), (U19), (U25) and (U32). (See Figure 5-33.)

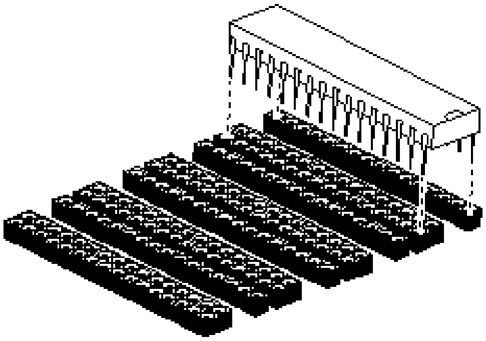


Figure 5-33: Installing 128K Cache Chip

Be sure to check the setting for **(J26) External Cache Size** on your system's motherboard. If necessary, change this jumper setting to match the amount of external cache you're installing on your system:

- If you're installing **128 KB** of external cache, be sure to remove the jumper from (**J26**) on the motherboard. (Save the jumper for future use.)

- If you're installing **512 KB** of external cache, be sure to **place jumper(s)** over pins **1-2** and **3-4** of **(J26)** on the motherboard.

See **Appendix D (Figure D-1)** for the external cache socket locations.

Video Memory Upgrade

Your system features 1 MB of video memory, which is surface-mounted at (U22) and (U36) on the motherboard. **You can upgrade your system's video memory to 2 MB by installing two 256Kx16 (70ns) ZIP DRAM chips with (2) CAS lines (symmetrical).**

To upgrade to 2 MB, use the following procedure:

Install two 256Kx16 (70ns) DRAM ZIP (Zigzag Inline Package) chips at ZIP socket locations **(U26)** and **(U27),** which are located just left of **(U22)** and **(U36)** on the motherboard (Page D-18, Fig. D-1). **When installing ZIP chips, be sure that the beveled edge of the chip faces toward the (J14) VESA Feature Connector on the motherboard, and that all pins are aligned with the ZIP socket holes**. (For example, Pin 1 of the ZIP chip should be aligned with Pin 1 of the socket.) Press the chip firmly into place.

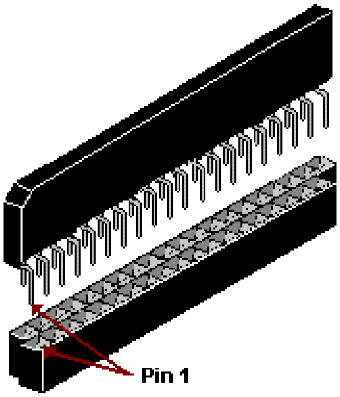


Figure 5-34: Installing Video DRAM ZIP Chip

Step 3: SETUP

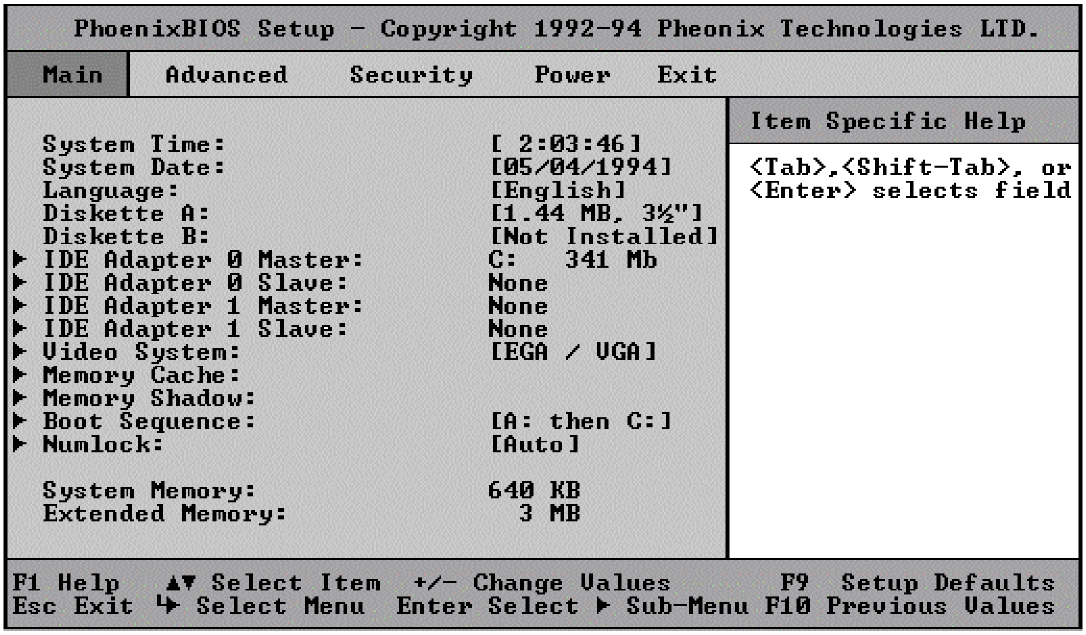
To set up your disk drives and memory upgrade:

1. Run the Setup program by pressing the **F2** function key during the POST test (when the system boots up). You should see the SETUP Main Menu on the screen.

2. To select any item on the SETUP Main Menu, press the Up/Down arrow until the highlight cursor moves to the item you want to select.

3. To select an option's **sub-menu**, highlight the item preceded by the **arrowhead symbol**, then press the **ENTER** key. For example, press the **right arrow** (cursor) key to move to the **Advanced** menu, then press the **ENTER** key to access the **Integrated Peripherals** sub-menu. Highlight the desired setting, and specify the correct setting(s) for your device(s), as necessary.

4. To change any item on the SETUP Main Menu, press the Plus or Minus keys on the numeric keypad until the desired entry is displayed.



```
     PhoenixBIOS Setup - Copyright 1992-94 Pheonix Technologies LTD.
   Main     Advanced     Security     Power    Exit
                                                  Item Specific Help

  System Time:                  [ 2:03:46]       <Tab>,<Shift-Tab>, or
  System Date:                  [05/04/1994]     <Enter> selects field
  Language:                     [English]
  Diskette A:                   [1.44 MB, 3½"]
  Diskette B:                   [Not Installed]
▶ IDE Adapter 0 Master:         C:   341 Mb
▶ IDE Adapter 0 Slave:          None
▶ IDE Adapter 1 Master:         None
▶ IDE Adapter 1 Slave:          None
▶ Video System:                 [EGA / VGA]
▶ Memory Cache:
▶ Memory Shadow:
▶ Boot Sequence:                [A: then C:]
▶ Numlock:                      [Auto]

  System Memory:                640 KB
  Extended Memory:                3 MB

F1 Help    ▲▼ Select Item  +/- Change Values       F9  Setup Defaults
Esc Exit  ↳ Select Menu  Enter Select ▶ Sub-Menu F10 Previous Values
```

Figure 5-35: Setup Main Menu

Disk Drives Setup

First, you need to set the type of floppy disk drive(s) you have. The SETUP program supports the following floppy disk drives:

- 5.25", 360 KB (Double Density)
- 5.25", 1.2 MB (High Density)
- 3.5", 720 KB (Double Density)
- 3.5", 1.44 MB (High Density)
- 3.5", 2.88 MB (Optional)

If you have more than one floppy disk drive, set both Diskette A: and Diskette B: accordingly.

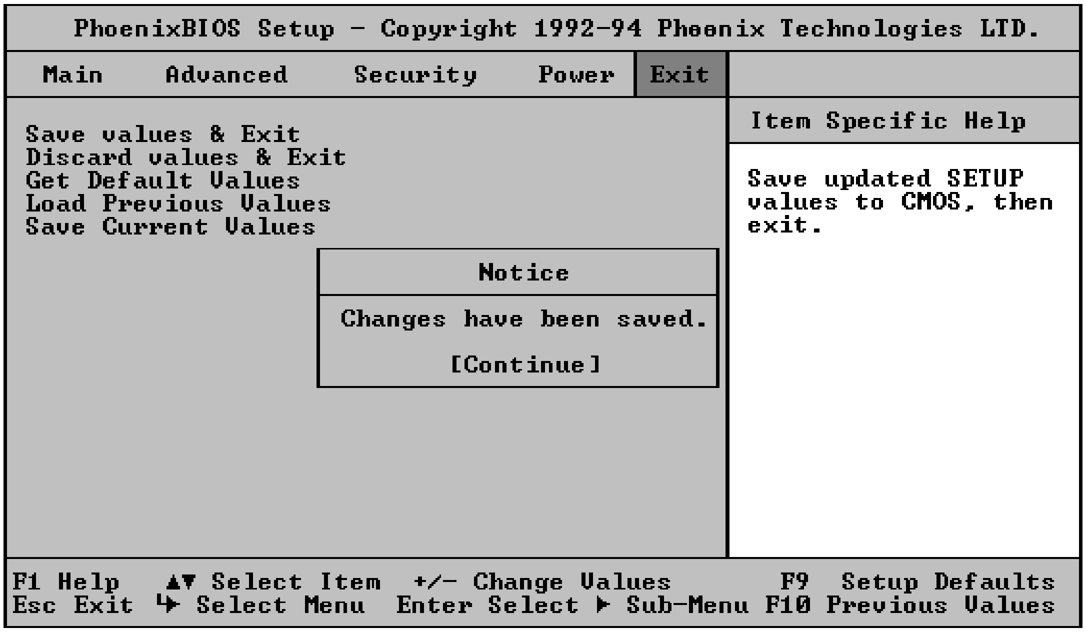
The type of hard disk drive(s) you have must also be set correctly. If you don't know the type of hard disk drive you have, please refer to "Your System Credentials (Note to Customer)" packaged with your system, or consult Packard Bell Technical Support for assistance.

Memory Upgrade Setup

The base memory size of your computer system is fixed at 640 KB. The memory above base memory may be set as extended memory. See Tables 5-1 and 5-2, beginning on **page 5-29** for amounts of available memory with indicated amounts of installed DRAM.

Saving Changes and Exiting SETUP

After changing settings, press **ESC** to exit SETUP. You will see the Exit menu shown in Figure 5-36.



```
   PhoenixBIOS Setup - Copyright 1992-94 Phoenix Technologies LTD.
  Main     Advanced     Security     Power    Exit

 Save values & Exit                             Item Specific Help
 Discard values & Exit
 Get Default Values                             Save updated SETUP
 Load Previous Values                           values to CMOS, then
 Save Current Values                            exit.

                                  Notice

                          Changes have been saved.

                                [Continue]

F1 Help    ▲▼ Select Item  +/- Change Values       F9  Setup Defaults
Esc Exit   ↵ Select Menu  Enter Select ▶ Sub-Menu F10 Previous Values
```

Figure 5-36: Setup Exit Menu

You have the option to continue, exit with changes, load default settings, or exit without saving any changes. Once you have made changes on the SETUP program's menus, you should check to be sure that all settings are correct before you exit the Phoenix SETUP Utility. To save the changes, highlight the **Save Values & Exit** option, then press the **ENTER** key. You will automatically exit the Phoenix SETUP Utility, and the system will reboot. The configuration changes specified are made in CMOS RAM and will take effect when the system reboots.

6

Maintenance And Troubleshooting

Your Packard Bell computer is engineered and manufactured to be durable and to give you trouble-free service. Nevertheless, like any other piece of electronic equipment, it will require periodic maintenance.

Maintenance and Care

- Clean your computer when it has gathered too much dust. First, switch it off and disconnect all power cords. Then, clean it with a damp piece of cloth. Do NOT apply liquid or any cleaner directly to your computer.

- We highly recommend the use of a Surge Protector for the computer and all peripheral devices, such as your monitor and printer.

- Do not use a power cable that does not meet the specifications. (See **page C-5**).

- Other than installations described in this manual, do NOT attempt to service any part of the computer yourself. When installing internal devices, please be extra careful and follow the instructions in **Chapter 5: Internal Installations**.

- Do NOT switch the power on when the Floppy Disk Drive Protector Card is in the disk drive. This may damage your floppy disk drive.
- Do NOT unplug the power cord while the system is on. After you have switched the power off, wait ten seconds before switching the power on again.
- If you have any doubt regarding the operation of your computer system, please consult your dealer or Packard Bell Technical Support for assistance.

Troubleshooting

Common Problems and Solutions

Listed below are some problems you could encounter, and some suggestions on how to correct them.

System Fails to Start Up Check that the power indicator on the front panel is on. Switch it off, wait ten seconds, and switch it ON again.

Inspect the power cord for damage. Also check for proper connection of the power cord.

No Display on Video Monitor Check that the power indicator and switch on the monitor are ON. Inspect the power cord and signal cable for damage. If everything is fine, type the following command at the DOS prompt:

`dir` (press the **ENTER** key)

Then adjust the brightness and contrast controls on the monitor and see if the display appears.

Floppy Disk Problems

Remove the diskette from the disk drive and check that the diskette was inserted correctly (with the labeled side facing UP and/or with a single notch on the left side of the disk). Check that the diskette is the right type for the disk drive (see the Floppy Disk Drive section in **Chapter 4: Putting Everything To Work**).

1. If necessary, save your work to your hard disk drive and close any open applications you may have been working in. Exit to the DOS prompt, then reboot your system.

2. Press the **F2** key during the POST (Power On System Test) test to enter the SETUP Utility. See if the disk drive is configured correctly in the Main Menu.

Hard Disk Problems

If the hard disk is newly-installed, read the steps in **Chapter 5: Internal Installations** and see if the hard disk has been properly installed.

1. If the hard disk is not newly-installed, and has been working until now, save your work to your floppy disk drive and close any open applications you may have been working in. Exit to the DOS prompt, then reboot your system.

2. Press the **F2** key during the POST (Power On System Test) test to enter the SETUP Utility. See if the hard disk drive type is configured correctly in the Main Menu.

NOTE

Your system's SETUP Utility program features **AUTO-Select**, for identification of most hard disk types.

If the previous suggestions don't work, contact your dealer or Packard Bell Technical Support for assistance.

Appendix A: Hard Disk Format And Partition Guide

Factory-installed hard disk drives have been formatted and partitioned, and are ready to use. For a *newly-installed* hard disk drive, however, the following three tasks must be performed in exact order:

- Low Level Format - Formats the cylinders of the hard disk.
- Create DOS Partitions - Designates the partitions of the hard disk.
- High Level Format - Formats the partitions for the particular operating system.

Low Level Format

If you believe that a low level format is required for your hard disk, contact Packard Bell Technical Support for assistance.

Create DOS Partitions

Under the MS-DOS operating system, each hard disk can be divided into one or more partitions, and each partition may contain a different operating system. This is performed by a menu-driven utility program called FDISK.EXE, located on the backup MS-DOS diskette that you created with the system's Disk Image program. Using this utility program, you can:

- Create a primary MS-DOS partition.
- Create extended MS-DOS partitions.
- Change the active partition.
- Delete an MS-DOS partition.
- Display partition area.

To run FDISK.EXE, insert the backup MS-DOS diskette containing FDISK.EXE in drive A and type:

`a:fdisk` (and press the **ENTER** key)

Follow the on-screen instructions. For more information about the FDISK program, contact Packard Bell Technical Support.

High Level Format

NOTE This section only applies if you will be using the MS-DOS operating system. If you plan to use another operating system, such as UNIX, refer to the User's Manual for that operating system and perform its particular format procedure.

After the DOS partition has been created, you must format each partition and transfer the system files into the hard disk in order to use it.

To do this, insert the backup MS-DOS diskette containing FORMAT.COM in the disk drive and type:

`a:format c:/s` (and press the **ENTER** key)

You will see:

```
WARNING, ALL DATA ON NON-REMOVABLE DISK
DRIVE C: WILL BE LOST!
Proceed with Format (Y/N)?
```

Press "Y" followed by **ENTER** to format the disk or partition.

When the formatting is complete, the screen will display:

```
Format Complete
System Transferred
xxxxxxx bytes total disk space
xxxx bytes used by system
xxxxx bytes in bad tracks
xxxxx bytes available on disk
```

Remove the floppy disk from the drive and press the **CTRL + ALT + DEL** key command. After a few moments of disk activity, your screen should display this prompt:

```
c>_
```

Your computer has successfully "booted" from the hard drive. You may now copy your favorite application programs to the hard drive, and begin using your computer.

If you divided your hard disk into two or more partitions, you must repeat the formatting procedure for each partition. Insert the backup MS-DOS diskette containing FORMAT.COM in drive A: and type:

`a:format x:` (and press the **ENTER** key)

where x is the name of the partition you want to format. **(Notice that `/s`, used in the command to format partition C:, is omitted for subsequent partitions.)**

Appendix B: Error Messages and Solutions

When the power is switched on, or when the system is reset, the computer will go through initialization, which includes the Power-On Self Test (POST). If any errors are detected, an error message will appear on the screen. The following is a list of these error messages, their causes and possible solutions. If you need assistance, contact Packard Bell Technical Support.

Error Messages

Message	Diskette configuration error.
Cause	The specified configuration is not supported by the BIOS.
Solution	Change the configuration.

Message	Diskette drive 0 seek failure.
Cause	The A: drive has failed or is missing.
Solution	Check the A: drive.

Message	Diskette drive 1 seek failure.
Cause	The B: drive has failed or is missing.
Solution	Check the B: drive.

Message	Diskette read failure - strike F1 to retry boot.
Cause	The diskette is either not formatted or defective.
Solution	Replace the diskette with a bootable diskette and retry.

Message	Errors found incorrect configuration information memory size mismatch.
Cause	Self Test reports that the memory size does not agree with configuration information.
Solution	Run SETUP and enter correct memory information.

Message	Hard disk configuration error.
Cause	The specified configuration is not supported by the BIOS.
Solution	Check the hard disk configuration.

Message	Hard disk controller failure.
Cause	The hard disk controller card has failed..
Solution	Service the controller card..

Message	Hard disk failure.
Cause	Bad hard disk.
Solution	Try rebooting. If this does not work, replace the hard disk.

Message	Hard disk read failure - strike F1 to retry boot.
Cause	The hard disk is defective.
Solution	Try rebooting. If this does not work, service the hard disk.

Message	Invalid configuration.
Cause	FDD, HDD, Memory or Display type is configured incorrectly.
Solution	Run SETUP and enter correct configuration.

Message	Keyboard clock line failure, Keyboard data line failure.
Cause	Either the keyboard or the cable connection is defective.
Solution	Make sure the keyboard cable and keyboard are connected properly.

Message	Keyboard is locked ---- please unlock.
Cause	The keyboard lock is activated.
Solution	Disengage the keyboard lock.

Message	Keyboard stuck key failure.
Cause	A key is jammed.
Solution	Try pressing the key again. If this does not work, please service your keyboard.

Message	Memory parity failure at *hex-value*.
Cause	One of the parity memory chips has failed.
Solution	Replace the memory chip.

Message	Memory write/read failure at *hex-value*.
Cause	One of the memory chips has failed.
Solution	Replace the memory chip.

Message	No boot device available - strike F1 to retry boot.
Cause	Either the diskette drive A:, the hard disk, or the diskette is defective.
Solution	Replace the diskette and retry. Check hard disk.

Message	Not a boot diskette - strike F1 to retry boot.
Cause	The diskette in A: drive is not formatted as a bootable diskette.
Solution	Replace the diskette with a bootable diskette and retry.

Message	Time-of-day clock stopped
Cause	The CMOS time-of-day clock chip has failed.
Solution	Run SETUP.

Message	Time-of-day not set - please run the SETUP program.
Cause	Clock is not set.
Solution	Run SETUP.

Informational Messages

Message	*nnn*K Base Memory.
Meaning	The amount of base memory that tested successfully.

Message	*nnn*K Expanded Memory.
Meaning	The amount of expanded memory that tested successfully.

Message	*nnn*K Extended Memory.
Meaning	The amount of extended memory that tested successfully.

Message	*nnn*K Extra Memory.
Meaning	The amount of extra memory that tested successfully.

Message	*nnn*K Standard Memory.
Meaning	The amount of standard memory that tested successfully.

Message	Decreasing available memory.
Meaning	This message immediately follows any memory error message, and informs you that the memory chips are failing.

Message	Memory tests terminated by keystroke.
Meaning	This message indicates that you have pressed the Spacebar while the memory tests were running. This stops the memory tests.

Message	Strike the F1 key to continue.
Meaning	This message indicates that an error was found during POST. Pressing the F1 key allows the system to attempt to reboot.

Message	Base Memory Size = 64K.
Meaning	Used in reporting base memory for Extended Features.

Message	Extended Memory Size = 00000K.
Meaning	Used in reporting extended memory size for Extended Features.

Run-time Messages

Run-time messages are displayed if an error occurs after the boot procedure is complete.

Message	I/O card parity interrupt at *address*. Type (S)hut off NMI, (R)eboot, other keys to continue.
Possible Cause	The peripheral card has failed.
Solution	Type (S)hut off NMI. Note: This will only temporarily allow you to continue. You must replace the peripheral card.

Message	Memory parity interrupt at *address*. Type (S)hutoff NMI, (R)eboot, other keys to continue.
Possible Cause	A memory chip(s) has failed.
Solution	Type (S)hut off NMI. Note: This will only temporarily allow you to continue. You must replace the memory chip.

Message	Unexpected HW interrupt at *address*. Type (R)eboot, other keys to continue.
Possible Cause	This could be any hardware-related problem.
Solution	Check the hardware. Note: Not displayed if the extended interrupt handler is not enabled.

Message	Unexpected SW interrupt at *address*. Type (R)eboot, other keys to continue.
Possible Cause	There is an error(s) in the software program.
Solution	Try turning the machine off and then on again. If that doesnt work, check the program. Note: Not displayed if the extended interrupt handler is not enabled.

Informational, Run-time, and Initialization Messages

Message	Changes will take effect when machine reboots.
Meaning	Extended Features configuration has been completed and will take effect the next time the system is booted.
Message	Unable to allocate memory - please reboot following configuration. F1 to continue.
Meaning	Extended Memory has been improperly allocated. Press F1 to continue; then reconfigure Extended Features using a different extended memory allocation scheme.
Message	F1 to enable extended features; F2 to disable.
Meaning	Extended Features can now be enabled by pressing F1. Press F2 at any time to disable Extended Features.
Message	Insufficient extended memory for extended features.
Meaning	This system does not have enough extended memory. A minimum of 1 MB of extended memory is required for Extended Features. Add more memory.

Appendix C: Specifications

Standard Features

- High performance desktop computer supports 486 CPU family and OverDrive Processors.
- Optional Peripheral Component Interconnect (PCI) architecture enhances system performance.
- Supports Plug and Play compatible ISA adapter cards, for easier system expansion.
- Optional PCI Riser Card with OPTi 82C822.
- Two-level Password Protection (User/Supervisor) provides improved system security.
- Motherboard with Intel optional SL Enhanced 80486SX, IntelSX2 (80486SX2), 80486DX or IntelDX2 (80486DX2), and OPTi AT-compatible chip set 82C802 and 82C602.
- 4 MB of RAM standard onboard, expandable to 64 MB on the motherboard.
- 1Mbit FLASH EPROM DIP or 2Mbit TSOP with Phoenix System BIOS.
- 80486SX, IntelSX2, 80486DX and IntelDX2 support Intels Upgrade OverDrive™ Processor Technology; a processor which increases the internal processing speed may be added. (Contact Packard Bell Technical Support for information on the Pentium OverDrive Processor upgrade for IntelSX2/ IntelDX2.)
- 8 KB internal cache in 80486SX, IntelSX2, 80486DX and IntelDX2. 128KB or 512KB External Cache optional.

- CL-GD5428 Local Bus Video Controller/Windows Accelerator runs at CPU speed for improved VGA performance. Also improves performance when using Microsoft Windows Graphical User Interface.

- Real time clock and system configuration in CMOS RAM with rechargeable lithium battery backup.

- 101/102-key IBM PC-AT compatible new enhanced keyboard.

- **Model 3x3 Series:** 3 expansion slots, featuring 3 ISA (AT-compatible) 16-bit connectors. Optional PCI Riser Card features 1 ISA (AT-compatible) 16-bit connector, 1 PCI connector, and 1 combined expansion slot that accommodates either an ISA or a PCI adapter card.

- **Model 4x4 Series:** 4 expansion slots, featuring 4 ISA (AT-compatible) 16-bit connectors. Optional PCI Riser Card features 2 ISA (AT-compatible) 16-bit connectors, 1 PCI connector, and 1 combined expansion slot that accommodates either an ISA or a PCI adapter card.

- A total of three or four half-height disk drive cavities, on the Model 3x3 Series and Model 4x4 Series systems, respectively.

- Runs under MS-DOS, UNIX (XENIX), OS/2, Windows NT.

Motherboard

- Supports 64 MB DRAM maximum

- Intel optional SL Enhanced 80486SX, IntelSX2 (80486SX2), 80486DX or IntelDX2 (80486DX2) high performance 32-bit microprocessor with two operating modes:

    - **Real Address Mode:** Supports 1 MB memory address space. Fully code-compatible with 8088, 8086, 80286, and 80386.

    - **Protected Mode:** Supports 4 GB (G=Giga=109) of physical memory address space and 64 TB (T=Tera=1012) of virtual memory address space.

- Four-level memory protection.

- Built-in memory management unit.

- Internal Math Coprocessor on 486DX/IntelDX2 systems.

System Clock Speed

- Both Series: 25 or 33 MHz for 80486SX or 80486DX processor; internal processing speed higher for IntelSX2, IntelDX2 or Pentium OverDrive Processor.

Memory

- ROM: 128 KB supported.

- RAM: The standard memory configuration includes 4 MB of surface-mounted DRAM on the motherboard. (2) 72-pin SIMM Sockets are available for memory expansion. You can use SIMMs (Single In-line Memory Modules) to expand memory up to a total of 64 MB. See Chapter 5: Internal Installations for memory tables.

Built-in I/Os

- PS/2 Type mouse port.

- Keyboard controller and connector.

- Real-time clock/calendar.

- CMOS RAM to maintain system configuration.

- Speaker connector.

- **Model 3x3 Series:** (3) ISA (AT-compatible) connectors (16-bit). Optional PCI Riser Card: (1) ISA (AT-compatible) 16-bit connector, 1 PCI connector and (1) combined slot w/ ISA & PCI connectors.

- **Model 4x4 Series:** (4) ISA (AT-compatible) connectors (16- bit). Optional PCI Riser Card: (2) ISA (AT-compatible) 16-bit connectors, 1 PCI connector and (1) combined slot w/ ISA & PCI connectors.

- Built-in Floppy Disk Drive controller.

- Built-in dual IDE connectors.

- Built-in VESA Local Bus IDE connector.

- Built-in Serial port(s).

- Built-in Bidirectional Parallel port.

- Built-in high performance Local Bus VGA port.

Mass Storage

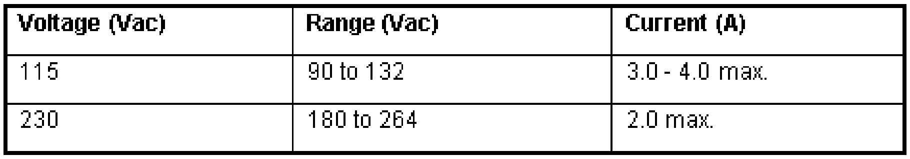
Model 3x3 Series: This computer comes with one 3.5 inch, 1.44 MB (2.88 MB optional) floppy disk drive standard (Drive A:). High capacity disk drives can be added as options. There are a total of three half-sized disk drive bays available. Depending upon your particular configuration, a 5.25 inch, 1.2 MB Floppy Disk Drive (Drive B:) and/or a Hard Disk Drive may have been added.

Model 4x4 Series: This computer comes with one 3.5 inch, 1.44 MB (2.88 MB optional) floppy disk drive standard (Drive A:). High capacity disk drives can be added as options. There are a total of four half-sized disk drive bays available. Depending upon your particular configuration, a 5.25 inch, 1.2 MB Floppy Disk Drive (Drive B:) and/or a Hard Disk Drive may have been added.

Power Supply

Input Requirement

The input voltage is selectable from a switch on the switching power supply (accessible from the back panel).



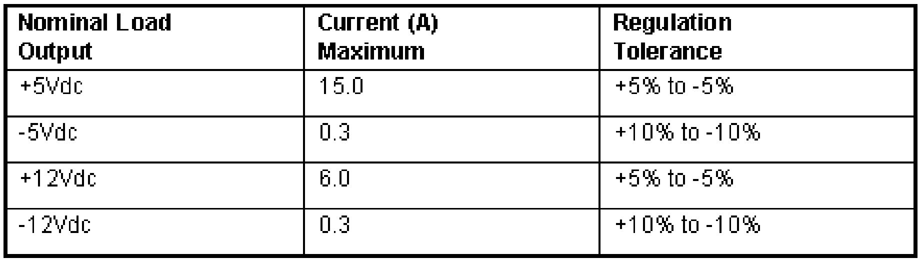
Voltage (Vac)	Range (Vac)	Current (A)
115	90 to 132	3.0 - 4.0 max.
230	180 to 264	2.0 max.

This equipment has a 3-wire, grounded power cord. To prevent electrical hazards, do not remove or defeat the ground prong on the power cord if it gets damaged. Contact Packard Bell Technical Support for a replacement.

In the U.S.A. and Canada, the power cord must be a UL-listed detachable power cord (in Canada, CSA-certified), type SV or SVT, 18 AWG, 3-conductor, provided with a molded-on NEMA type 5-15 P plug cap at one end and a molded-on cord connector body at the other end. The cord length must not exceed 15 feet (4.5 meters).

Outside the U.S.A. and Canada, the plug must be rated for 250 VAC, 10 amp minimum, and must display an international agency approval marking. The cord must be suitable for use in the end-user country. Consult your dealer or the local electrical authorities if you are unsure of the type of power cord to use in your country.

Output DC Load Requirement



Nominal Load Output	Current (A) Maximum	Regulation Tolerance
+5Vdc	15.0	+5% to -5%
-5Vdc	0.3	+10% to -10%
+12Vdc	6.0	+5% to -5%
-12Vdc	0.3	+10% to -10%

Rated Output Power:

- Both series: 150W max.

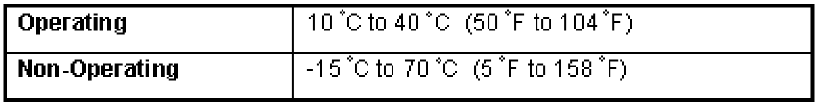
NOTE Specifications are subject to change without notice.

Keyboard

- New enhanced PS/2 Type compatible keyboard.
- Low-profile, 101 or 102 keys, detachable unit.
- 12 function keys.
- All keys are typematic.
- The keyboard uses a bi-directional serial interface to carry signal between the keyboard and the system.
- 3 status indicators (LEDs).

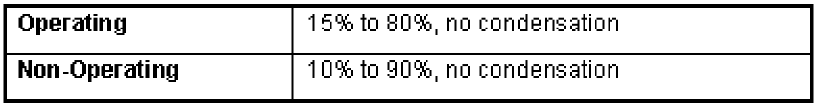
Environmental Specifications

Ambient Temperature



Operating	10 °C to 40 °C (50 °F to 104 °F)
Non-Operating	-15 °C to 70 °C (5 °F to 158 °F)

Humidity

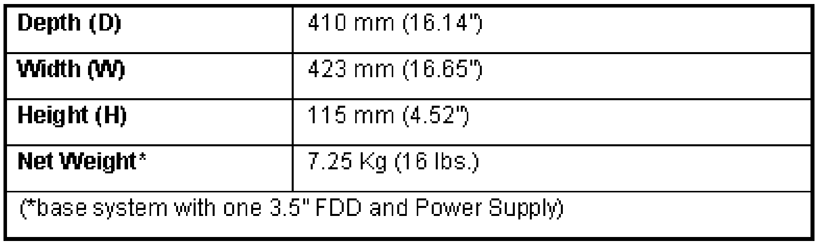


Operating	15% to 80%, no condensation
Non-Operating	10% to 90%, no condensation

(Specifications subject to change without notice.)

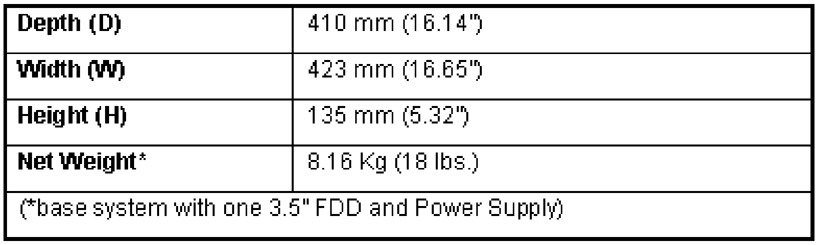
Dimensions

Model 3x3 Series



Depth (D)	410 mm (16.14")
Width (W)	423 mm (16.65")
Height (H)	115 mm (4.52")
Net Weight*	7.25 Kg (16 lbs.)
(*base system with one 3.5" FDD and Power Supply)	

Model 4x4 Series



Depth (D)	410 mm (16.14")
Width (W)	423 mm (16.65")
Height (H)	135 mm (5.32")
Net Weight*	8.16 Kg (18 lbs.)
(*base system with one 3.5" FDD and Power Supply)	

Appendix D: Connectors and Jumpers

Your system's motherboard (main circuit board) contains several connectors and jumpers which can be selected or set differently to give your computer more flexibility. These settings have been set to the factory default which most often gives the best performance. *You should not alter these settings unless you have had previous experience with this type of equipment.*

WARNING! **Electro-Static Discharge (ESD)** Before installing or touching any exposed printed circuit boards, computer parts, chips, etc., make sure that you are properly grounded. This is extremely important, as most internal computer components are highly susceptible to damage from Electro-Static Discharge (ESD).

Service technicians ground themselves by wearing an wrist strap (available at electronics supply stores) which is connected to an electrical ground (such as your system's Serial Port A). If you do not have a wrist strap, you can ground yourself and dissipate any electro-static build-up by doing the following:

1. Connect the computer's power cord between the computer and a three-pronged (grounded) electrical outlet.
2. **Power to the computer must be turned OFF.**
3. Touch, **and maintain continuous contact with**, an exposed metal surface of the computer system (such as the disk drive mounting tray, the metal surrounding the power supply or the unpainted portions of the computer's rear panel) while handling or touching any internal components, chips, add-on boards or disk drives.

Before you begin, make a note of what the original settings are. This way, you can always revert to the original settings if the new settings do not work.

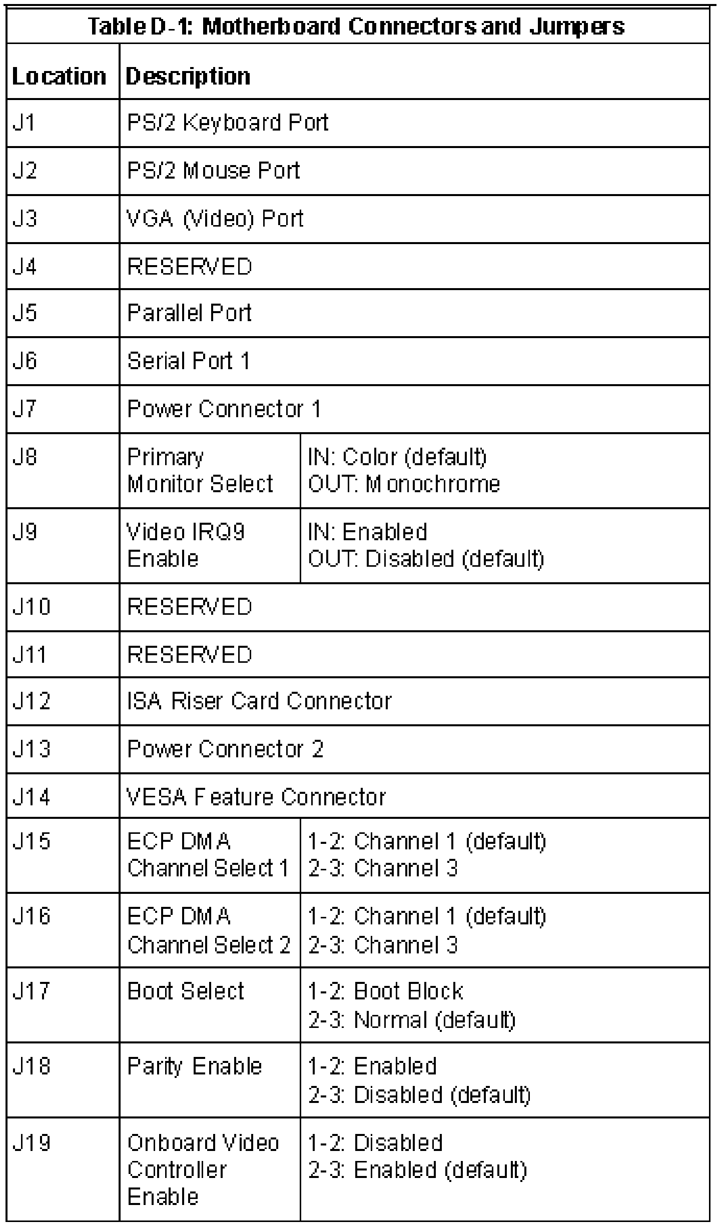


Table D-1: Motherboard Connectors and Jumpers

Location	Description	
J1	PS/2 Keyboard Port	
J2	PS/2 Mouse Port	
J3	VGA (Video) Port	
J4	RESERVED	
J5	Parallel Port	
J6	Serial Port 1	
J7	Power Connector 1	
J8	Primary Monitor Select	IN: Color (default) OUT: Monochrome
J9	Video IRQ9 Enable	IN: Enabled OUT: Disabled (default)
J10	RESERVED	
J11	RESERVED	
J12	ISA Riser Card Connector	
J13	Power Connector 2	
J14	VESA Feature Connector	
J15	ECP DMA Channel Select 1	1-2: Channel 1 (default) 2-3: Channel 3
J16	ECP DMA Channel Select 2	1-2: Channel 1 (default) 2-3: Channel 3
J17	Boot Select	1-2: Boot Block 2-3: Normal (default)
J18	Parity Enable	1-2: Enabled 2-3: Disabled (default)
J19	Onboard Video Controller Enable	1-2: Disabled 2-3: Enabled (default)

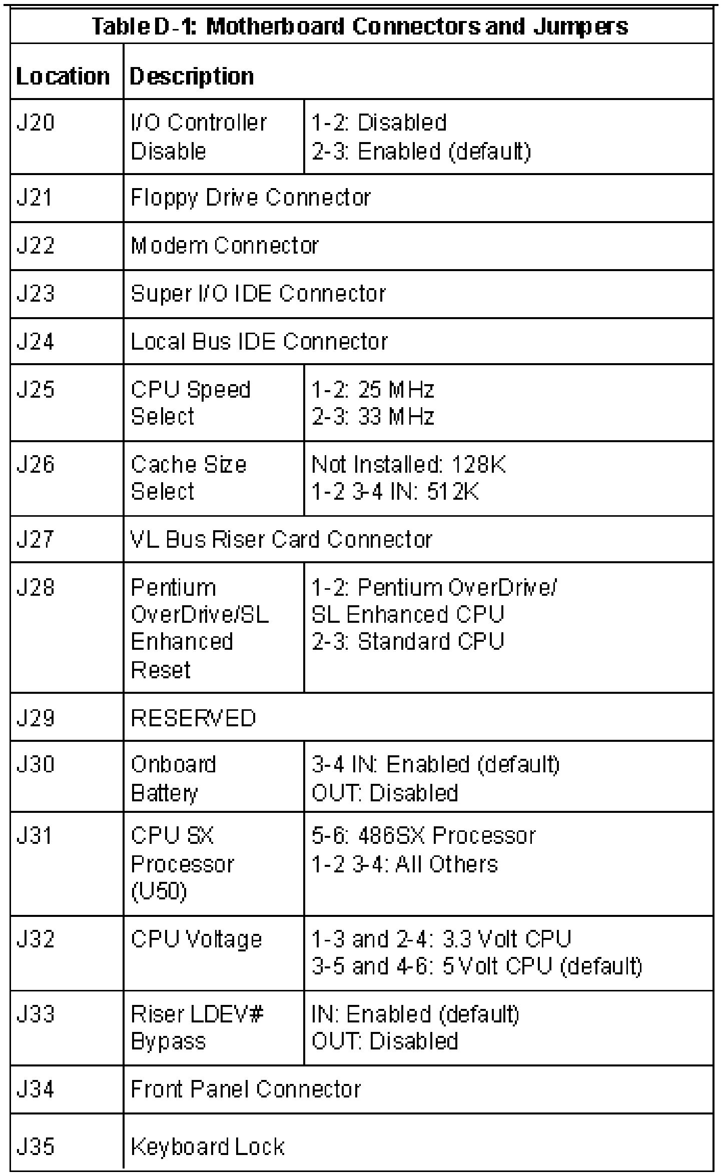


Table D-1: Motherboard Connectors and Jumpers

Location	Description	
J20	I/O Controller Disable	1-2: Disabled 2-3: Enabled (default)
J21	Floppy Drive Connector	
J22	Modem Connector	
J23	Super I/O IDE Connector	
J24	Local Bus IDE Connector	
J25	CPU Speed Select	1-2: 25 MHz 2-3: 33 MHz
J26	Cache Size Select	Not Installed: 128K 1-2 3-4 IN: 512K
J27	VL Bus Riser Card Connector	
J28	Pentium OverDrive/SL Enhanced Reset	1-2: Pentium OverDrive/ SL Enhanced CPU 2-3: Standard CPU
J29	RESERVED	
J30	Onboard Battery	3-4 IN: Enabled (default) OUT: Disabled
J31	CPU SX Processor (U50)	5-6: 486SX Processor 1-2 3-4: All Others
J32	CPU Voltage	1-3 and 2-4: 3.3 Volt CPU 3-5 and 4-6: 5 Volt CPU (default)
J33	Riser LDEV# Bypass	IN: Enabled (default) OUT: Disabled
J34	Front Panel Connector	
J35	Keyboard Lock	

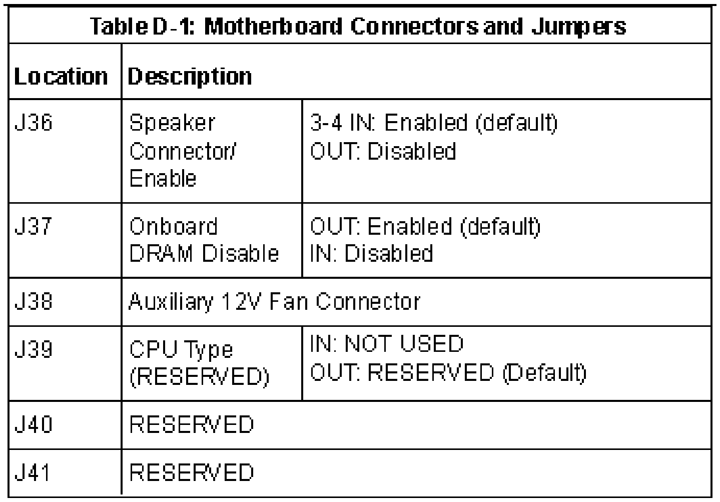
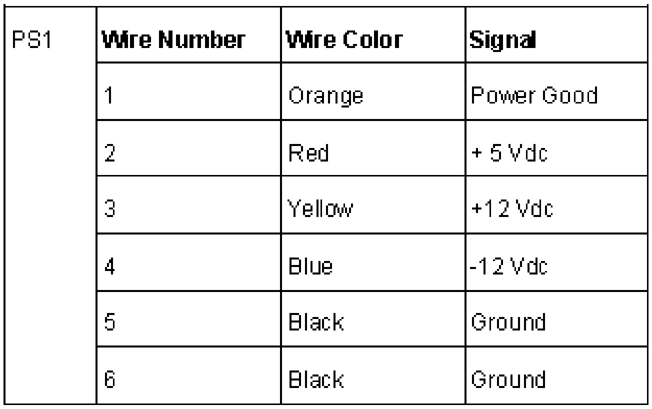


Table D-1: Motherboard Connectors and Jumpers

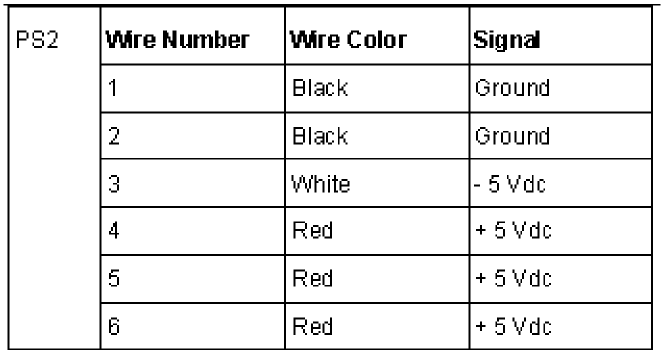
Location	Description	
J36	Speaker Connector/ Enable	3-4 IN: Enabled (default) OUT: Disabled
J37	Onboard DRAM Disable	OUT: Enabled (default) IN: Disabled
J38	Auxiliary 12V Fan Connector	
J39	CPU Type (RESERVED)	IN: NOT USED OUT: RESERVED (Default)
J40	RESERVED	
J41	RESERVED	

Power Supply Connectors

The PS1 and PS2 connectors of the switching power supply should be connected to the (J7) and (J13) connectors on the motherboard. The pin configuration is:

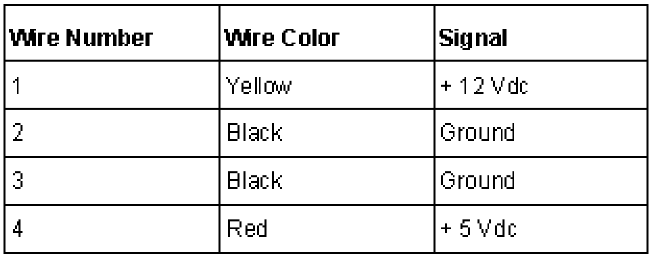


PS1	Wire Number	Wire Color	Signal
	1	Orange	Power Good
	2	Red	+ 5 Vdc
	3	Yellow	+12 Vdc
	4	Blue	-12 Vdc
	5	Black	Ground
	6	Black	Ground



PS2	**Wire Number**	**Wire Color**	**Signal**
	1	Black	Ground
	2	Black	Ground
	3	White	- 5 Vdc
	4	Red	+ 5 Vdc
	5	Red	+ 5 Vdc
	6	Red	+ 5 Vdc

Model 3x3 Series and **Model 4x4 Series** systems feature four connectors from the switching power supply: PA, PB, PC and PD. These have pin configurations and carry voltages which are identical. Each of them may be connected to a hard disk or floppy disk drive. PA, PB and PC are for 3.5 inch hard disk and 5.25 inch disk drives; PD is for a 3.5 inch floppy disk drive. The pin configuration is:



Wire Number	**Wire Color**	**Signal**
1	Yellow	+ 12 Vdc
2	Black	Ground
3	Black	Ground
4	Red	+ 5 Vdc

WARNING! Make sure the connection between the switching power supply and the motherboard is correct. Improper connection will damage the motherboard.

Motherboard Connectors and Jumpers

(J1) PS/2 Type Keyboard Port

J1 is a female 6-pin mini DIN connector built-in on the motherboard. It is only available for use with the PS/2 Type keyboard.

(J2) PS/2 Type Mouse Port

J2 is a female 6-pin mini DIN connector built-in on the motherboard. It is only available for use with a PS/2 Type mouse.

(J3) Extended VGA (Video) Port

J3 is a 15-pin DB15 video port built into the motherboard.

(J4) RESERVED

(J5) Bi-directional Parallel Port

J5 is a female DB25 bi-directional parallel port built-in on the motherboard.

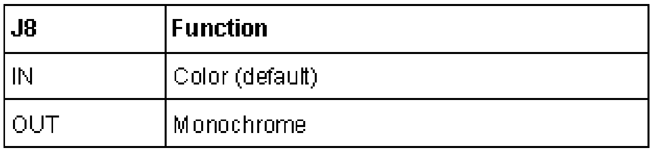
(J6) Serial (COM) Port 1

J6 is a male DB9 serial port built-in on the motherboard.

(J7), (J13) Power Connector 1 & 2

(See **page D-4**.)

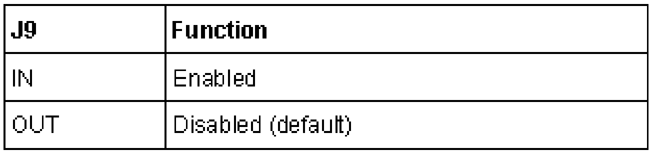
(J8) Primary Monitor Select



J8	Function
IN	Color (default)
OUT	Monochrome

(J9) Video IRQ9 Enable

J9 is a 2-pin jumper that enables or disables the IRQ9 interrupt.



J9	Function
IN	Enabled
OUT	Disabled (default)

(J10) RESERVED

(J11) RESERVED

(J12)/(J27) ISA Riser Card/VL Bus Riser Connector

Model 3x3 Series systems: The Riser Card inserted in (J12) and (J27) features **(3) ISA (AT-compatible) 16-bit connectors**. An optional PCI Riser Card features (1) ISA (AT-compatible) 16-bit connector, 1 PCI connector and (1) combined slot w/ ISA & PCI connectors.

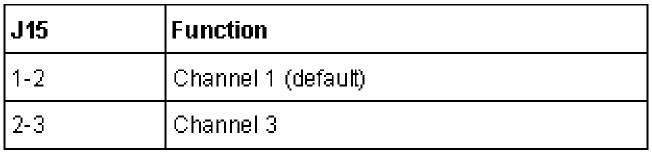
Model 4x4 Series systems: The Riser Card inserted in (J12) and (J27) features **(4) ISA (AT-compatible) 16-bit connectors**. An optional PCI Riser Card features (2) ISA (AT-compatible) 16-bit connectors, 1 PCI connector and (1) combined slot w/ ISA & PCI connectors.

(J14) VESA Feature Connector

J14 is a 26-pin connector built-in on the motherboard, which can accommodate either an 8514/A Type or Multimedia card.

(J15) ECP DMA Channel Select 1

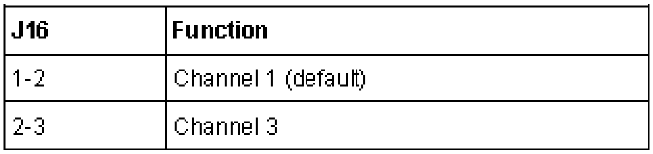
J15 is a 3-pin header connector that enables the DMA Channel, together with J16. **Be sure to set both (J15) and (J16) for the same setting.**



J15	Function
1-2	Channel 1 (default)
2-3	Channel 3

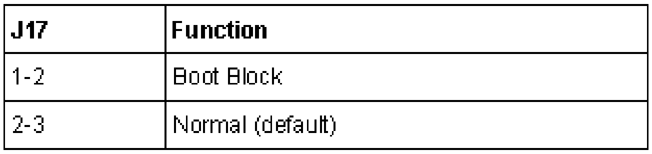
(J16) ECP DMA Channel Select 2

J16 is a 3-pin header connector that enables the DMA Channel, together with J15. **Be sure to set both (J15) and (J16) for the same setting.**



J16	Function
1-2	Channel 1 (default)
2-3	Channel 3

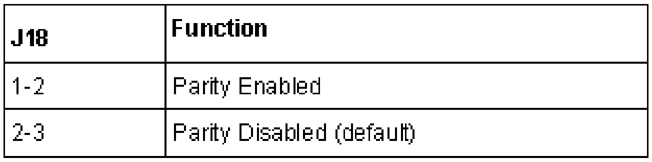
(J17) Boot Select



J17	Function
1-2	Boot Block
2-3	Normal (default)

(J18) Parity Enable

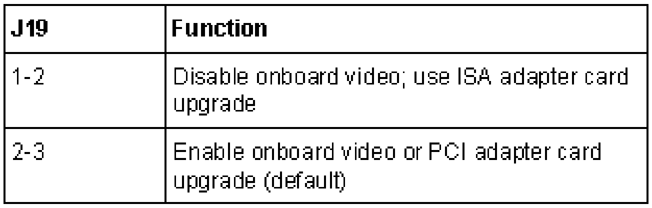
When J18 is enabled, parity will be generated to the system's DRAM.



J18	Function
1-2	Parity Enabled
2-3	Parity Disabled (default)

(J19) Onboard VGA Video Controller Enable

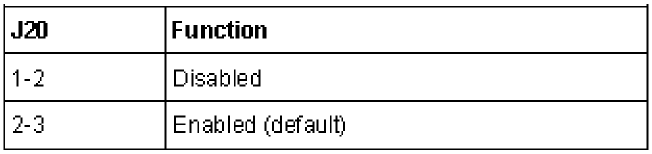
This setting selects either the built-in VGA or PCI adapter card interface, or a separate ISA VGA card.



J19	Function
1-2	Disable onboard video; use ISA adapter card upgrade
2-3	Enable onboard video or PCI adapter card upgrade (default)

(J20) I/O Controller Disable

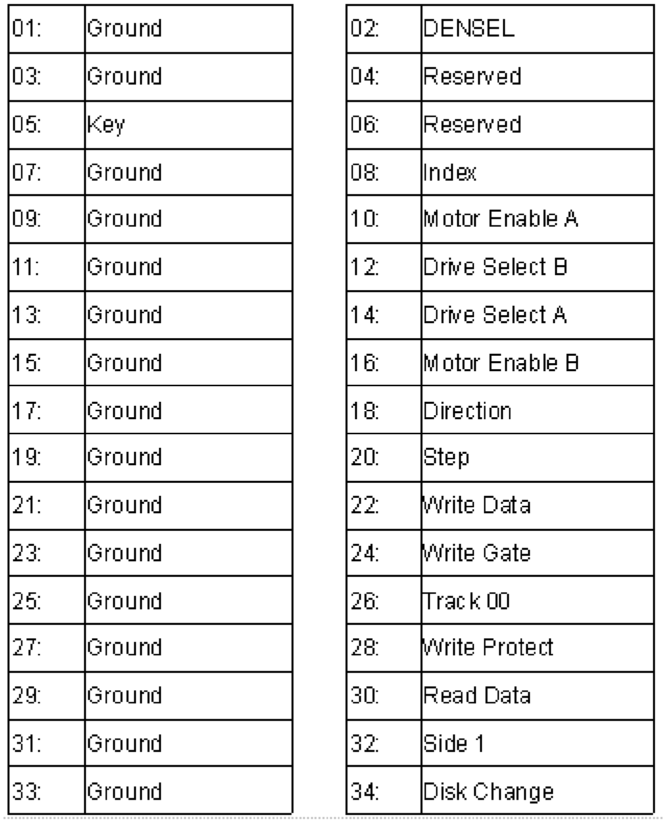
This setting enables or disables your system's IDE controller, floppy drive controller, serial port(s) and parallel port.



J20	Function
1-2	Disabled
2-3	Enabled (default)

(J21) Floppy Drive Connector

The floppy disk drive (FDD) is connected to the motherboard by connecting a 34-pin daisy-chained cable to J21. (All odd pins are grounded, except Pin 5 - Key.)



01:	Ground	02:	DENSEL
03:	Ground	04:	Reserved
05:	Key	06:	Reserved
07:	Ground	08:	Index
09:	Ground	10:	Motor Enable A
11:	Ground	12:	Drive Select B
13:	Ground	14:	Drive Select A
15:	Ground	16:	Motor Enable B
17:	Ground	18:	Direction
19:	Ground	20:	Step
21:	Ground	22:	Write Data
23:	Ground	24:	Write Gate
25:	Ground	26:	Track 00
27:	Ground	28:	Write Protect
29:	Ground	30:	Read Data
31:	Ground	32:	Side 1
33:	Ground	34:	Disk Change

(J22) Modem or Second Serial Port Connector

J22 is a 20-pin connector which is connected to the Modem card or Second Serial Port. (Modems are only included with certain systems). The Modem Card is mounted on the motherboard. The Modem or Second Serial Port can be set as COM1, COM2, COM3 or COM4, via the Advanced Setup Utility described in **Chapter 3**. The default setting should be COM1, unless your system does not include a modem or second serial port. In this case, the connector should be disabled in the Setup Utility.

(J23) Super I/O IDE Connector 1

Two hard disk drives (HDDs) can be connected to the motherboard by using a 40-pin daisy-chained cable connected to J23. IDE means Integrated Drive Electronics.

01:	Reset
03:	Host Data 7
05:	Host Data 6
07:	Host Data 5
09:	Host Data 4
11:	Host Data 3
13:	Host Data 2
15:	Host Data 1
17:	Host Data 0
19:	Ground
21:	Reserved
23:	Host IOW
25:	Host IOR
27:	IO CHRDY
29:	Reserved
31:	IRQ 14/15
33:	Host ADDR 1
35:	Host ADDR 0
37:	Host CS0
39:	Host SLV/ACT

02:	Ground
04:	Host Data 8
06:	Host Data 9
08:	Host Data 10
10:	Host Data 11
12:	Host Data 12
14:	Host Data 13
16:	Host Data 14
18:	Host Data 15
20:	Key
22:	Ground
24:	Ground
26:	Ground
28:	Reserved
30:	Ground
32:	Host 1016
34:	Reserved
36:	Host ADDR 2
38:	Host CS1
40:	Ground

IMPORTANT! Your system can boot up from the (primary) Local Bus IDE Connector 0, located at (J24) on your motherboard, rather than the (secondary) IDE Connector 1, located at (J23). When adding a hard disk drive to your system, be sure to connect your primary master (C:\) drive to (J24).

(J24) Local Bus IDE Connector 0

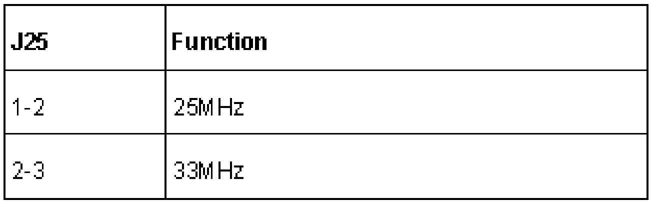
Two hard disk drives (HDDs) can be connected to the motherboard by using a 40-pin daisy-chained cable connected to J24. IDE means Integrated Drive Electronics.

01:	Reset	02:	Ground
03:	Host Data 7	04:	Host Data 8
05:	Host Data 6	06:	Host Data 9
07:	Host Data 5	08:	Host Data 10
09:	Host Data 4	10:	Host Data 11
11:	Host Data 3	12:	Host Data 12
13:	Host Data 2	14:	Host Data 13
15:	Host Data 1	16:	Host Data 14
17:	Host Data 0	18:	Host Data 15
19:	Ground	20:	Key
21:	Reserved	22:	Ground
23:	Host IOW	24:	Ground
25:	Host IOR	26:	Ground
27:	IO CHRDY	28:	Reserved
29:	Reserved	30:	Ground
31:	IRQ	32:	Host 1016
33:	Host ADDR 1	34:	Reserved
35:	Host ADDR 0	36:	Host ADDR 2
37:	Host CS1	38:	Host CS3
39:	Host SLV/ACT	40:	Ground

IMPORTANT! Your system can boot up from the (primary) Local Bus IDE Connector 0, located at (J24) on your motherboard, rather than the (secondary) IDE Connector 1, located at (J23). When adding a hard disk drive to your system, but sure to connect your primary master (C:\) drive to (J24).

(J25) CPU Speed Select

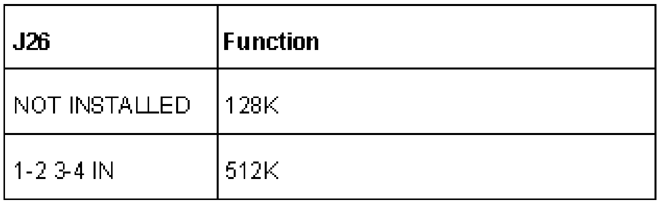
This 3-pin header connector selects the CPU Clock Speed.



J25	Function
1-2	25MHz
2-3	33MHz

(J26) Cache Size Select

J26 selects the external cache size. **(Note: If no external cache is installed, thIs jumper may be set randomly.)**



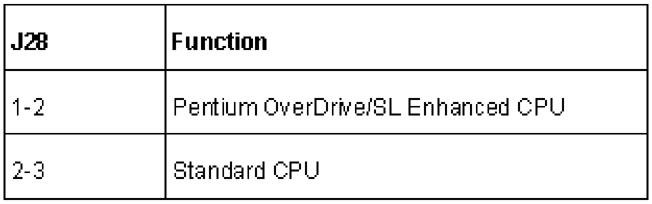
J26	Function
NOT INSTALLED	128K
1-2 3-4 IN	512K

(J27) VL Bus Riser Connector

See **page D-7**.

(J28) Pentium OverDrive/SL Enhanced Reset

J28 is a 3-pin header connector that selects either a Pentium OverDrive for DX2 or SL Enhanced processor, or another processor type.



J28	Function
1-2	Pentium OverDrive/SL Enhanced CPU
2-3	Standard CPU

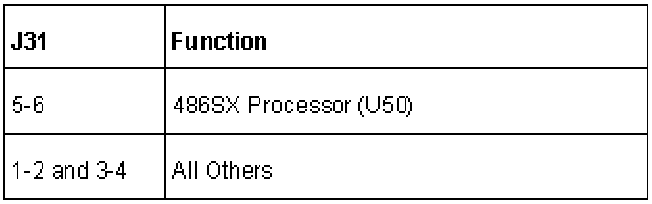
(J29) RESERVED

(J30) Onboard Battery Connector/Enable

J30 allows use of an optional off-board battery. To enable an external battery, remove the jumper from pins 3-4, and connect the external battery cable to J30.

(J31) CPU SX Processor

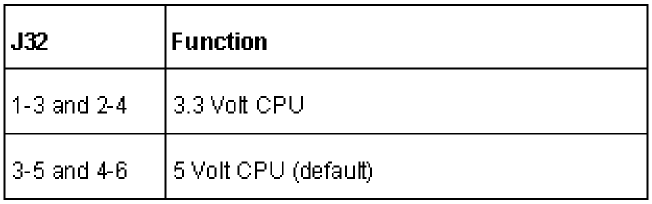
J31 selects either a **PGA Type 486SX** in the PGA upgrade socket (U50), or another processor type.



J31	Function
5-6	486SX Processor (U50)
1-2 and 3-4	All Others

(J32) CPU Voltage

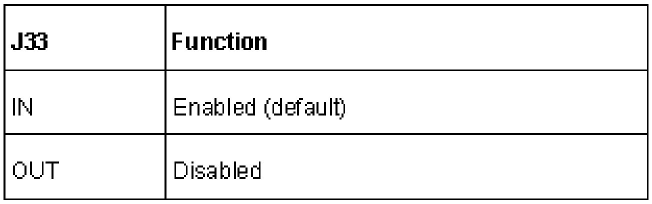
J32 regulates the CPU voltage.



J32	Function
1-3 and 2-4	3.3 Volt CPU
3-5 and 4-6	5 Volt CPU (default)

(J33) Riser LDEV# Bypass

J33 can be used to bypass a Local Bus device # signal if the riser doesn't provide this signal. **If you install a PCI Riser Card in your system, remove the jumper from J33.** (Otherwise, you shouldn't need to adjust this setting.)



J33	Function
IN	Enabled (default)
OUT	Disabled

(J34) Front Panel Connector

J34 is an 8-pin header connector for the front panel LEDs.

(J35) Keyboard Lock

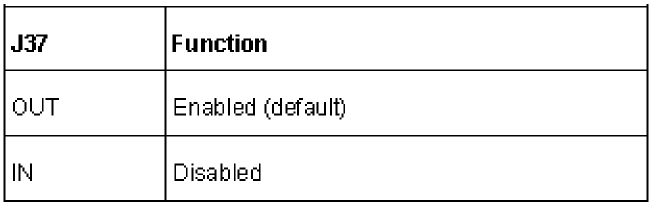
J35 is a 2-pin header connector.

(J36) Speaker Connector/Enable

J36 selects either the built-in speaker or an optional auxiliary speaker. There is a jumper over Pins 3-4 of this connector, which enables the onboard speaker. To use an external speaker, remove the jumper from pins 3-4 and connect your external speaker's cable to pins 1 and 4 of J36. (Save the jumper for future use.)

(J37) Onboard DRAM Disable

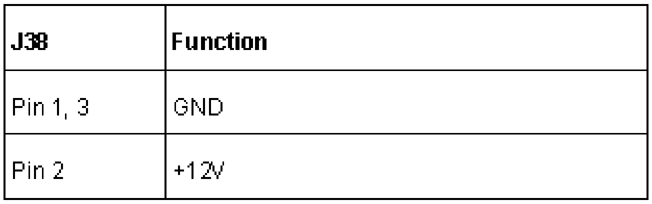
J37 can be used to disable your system's onboard DRAM (if installed).



J37	Function
OUT	Enabled (default)
IN	Disabled

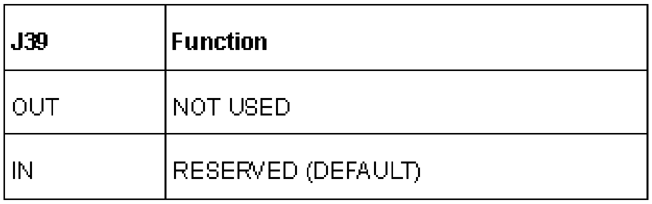
(J38) Auxiliary 12V Fan Connector

J38 provides 12V for the auxiliary fan.



J38	Function
Pin 1, 3	GND
Pin 2	+12V

(J39) CPU Type (RESERVED)

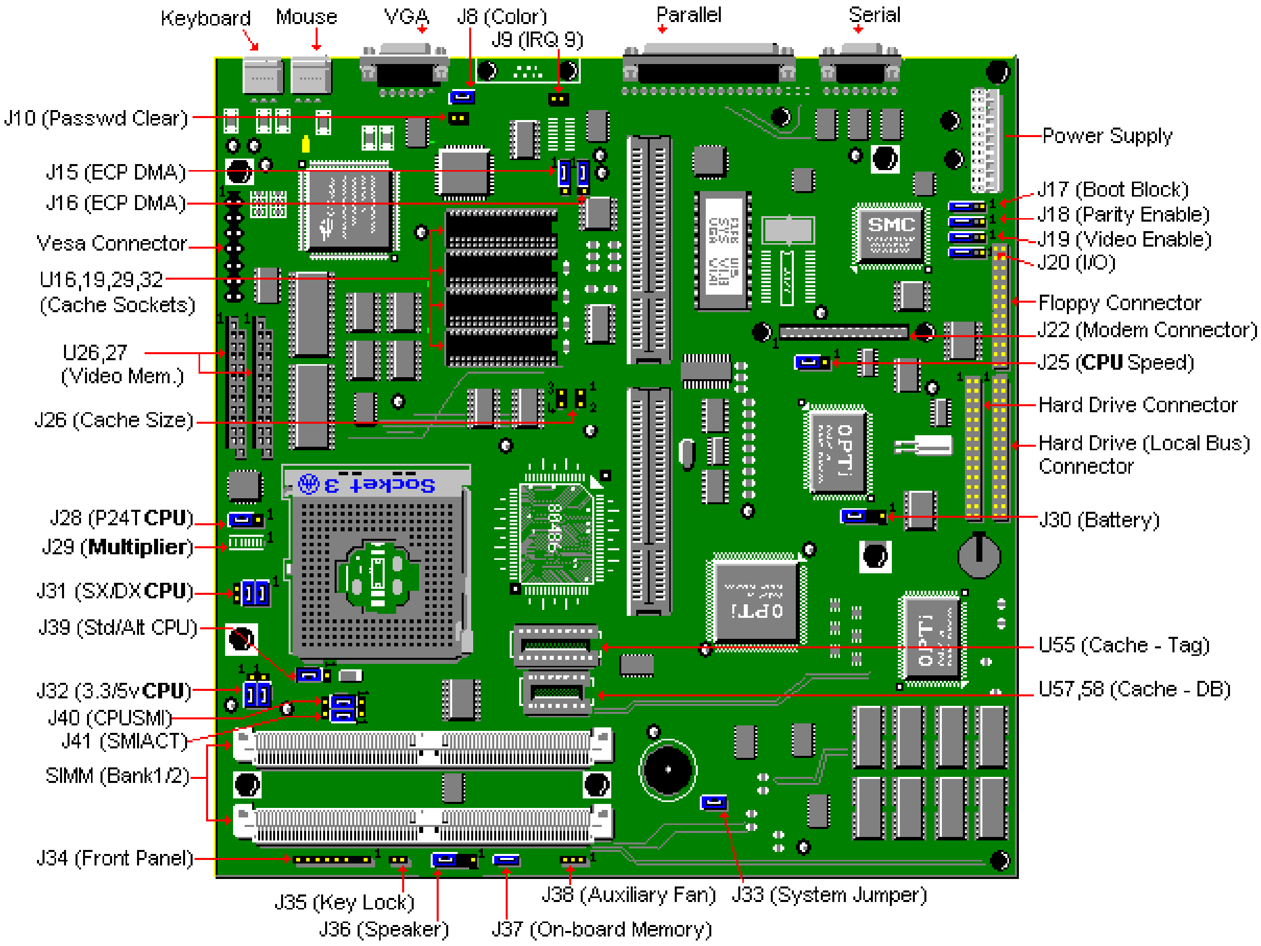


J39	Function
OUT	NOT USED
IN	RESERVED (DEFAULT)

(J40) RESERVED

(J41) RESERVED

Figure D-1: Motherboard layout



Appendix E:
VGA GUI Accelerator

Overview

Your system should be equipped with the Cirrus Logic CL-GD5428 Extended VGA Controller. The CL-GD5428 chip is a true color VGA controller offering an extensive range of industry-leading features and functionality for PC-compatible personal computers. Ideally suited to highly integrated systems, the CL-GD5428 requires no external support other than display memory and a 14-31.818MHz frequency reference. It is 100% hardware and BIOS compatible with PC VGA standards, and connects directly to the local bus (CPU bus), allowing a minimal components requirement.

The CL-GD5428 can operate at dot clock rates programmable up to 80MHz. It supports standard and VESA high-resolution and extended modes. The internal palette DAC may be configured as an industry-standard RAMDAC to provide a pallet of 256 colors, or true-color displays of 32K, 64K, and 16.8 million colors.

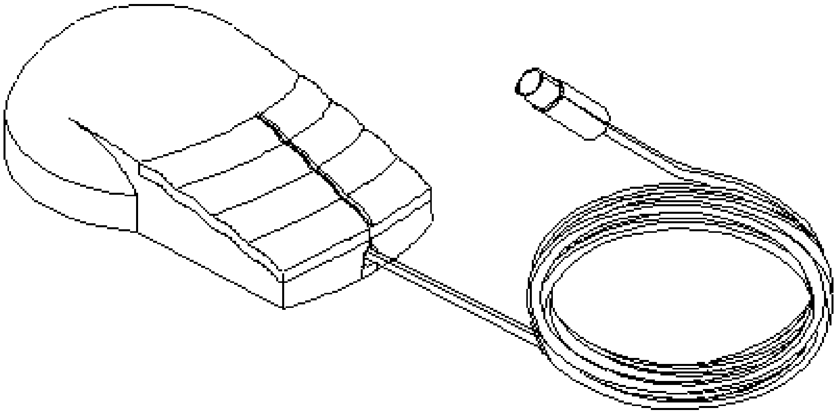
The internal dual-frequency synthesizer requires a single crystal or frequency reference for all supported screen resolutions, as well as all standard display memory speeds and formats. The chip implements all control and data registers according to current VGA standards. It also implements all standard data paths and data manipulation functions, providing complete hardware compatibility. In addition, the CL-GD5428 supports extended registers and compatibilities to provide functional and performance enhancements beyond standard VGA. It supports a 16-bit host interface in all operations, including I/O and memory operations in planar modes. The write cycles to memory are optimized with zero-wait-state capability.

Features

- Compatible with EGA, VGA and VESA® standards.
- 1 MB DRAM memory configuration, expandable to 2MB.
- Flexible design for use of appropriate type and amount of memory.
- Built-in True Color Palette DAC and Dual-frequency Synthesizer.
- 87 Hz refresh rate at 1280x1024x256 colors interlaced for CL-GD5428.
- Fast Page Mode access to display memory DRAMs for improved CPU performance when accessing display memory.
- Resolutions up to 1280x1024x256 colors interlaced (supported with 2MB video display memory installed).
- Graphic/Windows accelerator; 16-bit host memory and I/O interface improves GUI and graphics applications performance.
- Hardware BitBLT operation for accelerated performance in Graphical User Interfaces (GUIs), such as Microsoft® Windows.
- Host access to DRAMs through advanced write buffers provides faster host access for writes to display memory.
- 15-, 16- or 24-bit direct-color Palette DAC provides 16K, 32K, 64K, 256K or 16.8 million colors on-screen at once for life-like images. Provides high-color and true-color display for photo-realistic images.
- Local Bus interface increases system throughput.
- Overlay and color keying allows 16-bit pixel interfacing through the VESA® connector for multimedia applications.
- Independent video and DRAM timing for increased performance.

Appendix F:
Using the Mouse

Many Packard Bell computer systems come with a device called a mouse. If your system does not include a mouse, skip this appendix.



Removing packaging material

WARNING! Please read the following instructions before using your Packard Bell mouse!

Protective packaging material may be used inside the mouse to avoid damage to the internal components during shipping. This protective material must be removed in order for the mouse to function properly.

To remove the protective material from the mouse:

1. Turn the mouse over. Remove the mouse tracking ball cover by sliding it in the direction of the OPEN arrow printed on the mouse (see Figure F-1).

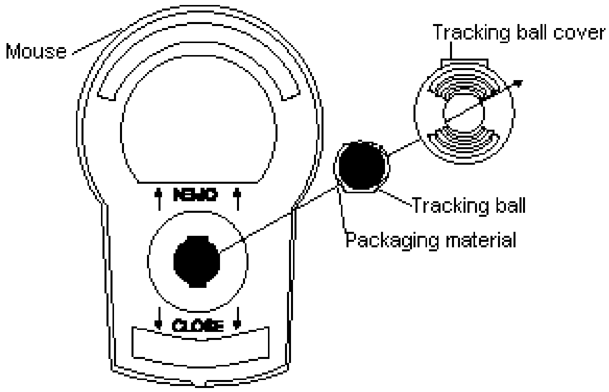


Figure F-1: Removing Packaging Material

2. Carefully lift up the tracking ball cover. Remove it to expose the tracking ball.

3. Turn the mouse face-up so that the tracking ball and packaging material drop out.

4. Turn the mouse over again, and place the tracking ball back into the hole.

5. To replace the tracking ball cover, first insert the cover's inner extended notch into the slot closest to the OPEN arrow on the mouse.

6. Once the OPEN arrow end of the cover is in place, press the cover down, then slide it back (toward the CLOSE arrow) until it locks into place.

The mouse is now ready for use.

Instructions

The Mouse is an opto-mechanical mouse cursor positioning device.

Compatibility

The mouse hardware is fully compatible with the Microsoft® Mouse, Mouse Systems™ Mouse and the PS/2™ Mouse.

System Requirements

- Packard Bell or other PC/XT/AT compatible computer system

- MS-DOS® version 2.0 or later
- One floppy disk drive
- PS/2 mouse port

Installing The Mouse

See connection instructions in **Chapter 2: Quick Start** or **Chapter 3: Setting Up**.

NOTE

On most systems, the mouse driver (software which activates the mouse for use with your computer and programs) is pre-installed on your hard disk drive and ready for use.

Locate the driver files

1. Before beginning this step, locate your mouse driver files. If the driver files aren't located on your hard drive, they may be located on a separate mouse driver diskette or utilities diskette that may be included with your system. Determine which diskette these files are on by inserting one of the diskettes in drive A:, close the drive door and, at the system prompt, type **A:** and **ENTER**, then type **DIR/P** and **ENTER**. Look for the file, MOUSE.COM. If it isn't on the first diskette, try another.

2. **We strongly recommend that you make a backup copy of the mouse driver.** Once this is done, store the original diskette in a safe place. (To learn how to copy files, see your MS-DOS or Microsoft Windows User's Guide.)

3. With the diskette containing the driver files in Drive A:, type A:MOUSE **ENTER** at the prompt.

You may now begin using your mouse with an application (program) which recognizes a mouse.

Hard Disk Installation

If your system has a hard disk and the mouse driver was not preinstalled, you should copy the mouse driver files into your root directory.

1. At the system prompt (C:\>), insert the diskette containing the mouse driver files into Drive A: and close the door to the drive.
2. Be sure that you are in Drive C: by typing, C: **ENTER**. Now, to get into the root directory, type CD\ **ENTER**.
3. Next, type MD MOUSE **ENTER**. This will create a directory for the driver files.
4. Type CD\MOUSE **ENTER**.
5. Type COPY A:MOUSE.COM **ENTER**. The driver file is now copied into the directory C:\MOUSE.
6. When you want to activate the mouse driver after turning on your system, type the following command at the system prompt (C:\>):

`CD C:\MOUSE` (and press the **ENTER** key)
`MOUSE` (and press the **ENTER** key)

Activating the driver automatically

If you want your mouse driver automatically activated each time you turn on your computer, you can modify your AUTOEXEC.BAT file by adding the following commands:

```
CD C:\MOUSE
MOUSE
CD C:\
```

This can be done using a text editor (EDLIN), or a word processing program. If you are creating an AUTOEXEC.BAT file from scratch, you may also use the COPY CON command.

See your MS-DOS User's Guide for further guidance.

Cleaning the Mouse

1. Turn off the computer.

2. Turn the mouse over and remove the retainer by pressing it in the direction indicated by the arrows (see Figure F-2).

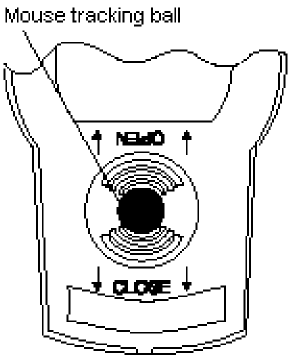


Figure F-2: Underside of mouse

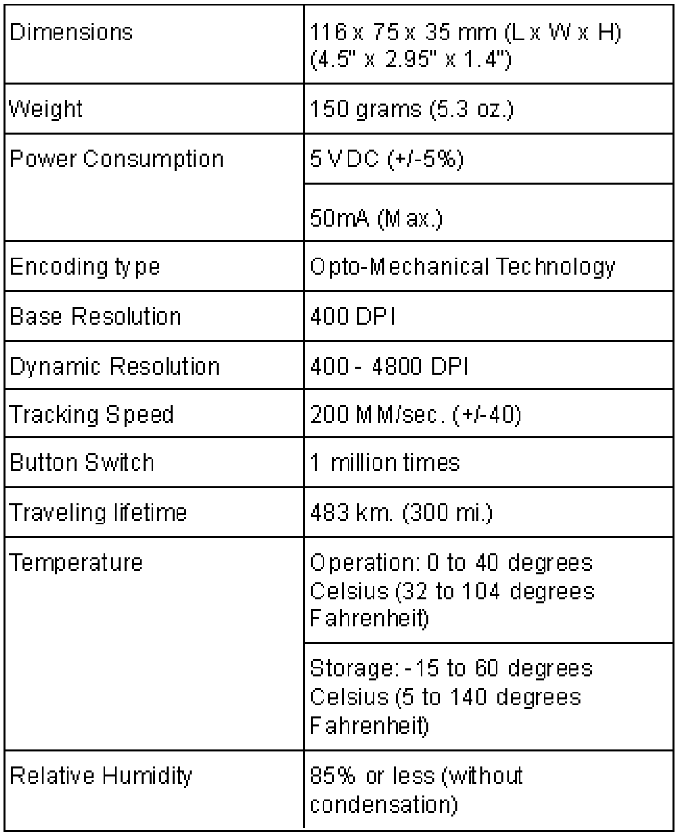
3. Turn the mouse right side up and let the rubber ball fall into your hand.

4. Wash the rubber ball in soapy water and dry it well.

5. Wipe the cover with a damp cloth.

6. Put the rubber ball back and replace the retainer. To secure the retainer, slide toward the CLOSE position (see Figure F-2).

Specifications



Dimensions	116 x 75 x 35 mm (L x W x H) (4.5" x 2.95" x 1.4")
Weight	150 grams (5.3 oz.)
Power Consumption	5 VDC (+/-5%)
	50mA (Max.)
Encoding type	Opto-Mechanical Technology
Base Resolution	400 DPI
Dynamic Resolution	400 - 4800 DPI
Tracking Speed	200 MM/sec. (+/-40)
Button Switch	1 million times
Traveling lifetime	483 km. (300 mi.)
Temperature	Operation: 0 to 40 degrees Celsius (32 to 104 degrees Fahrenheit)
	Storage: -15 to 60 degrees Celsius (5 to 140 degrees Fahrenheit)
Relative Humidity	85% or less (without condensation)

(Specifications subject to change without notice.)

Appendix G:
Using the Modem

Depending on the system you purchased, your Packard Bell internal modem or fax/modem card may support high-speed data, data/fax, and/or data/fax/voice operation, automatic format/speed sensing and error correction. This appendix will provide helpful information on how to use it.

Important! ***Some commands and specifications discussed in this appendix apply to 2400, 9600 or 14,400 bps modems, respectively. Depending on the system you purchased, you should refer to those commands and specifications appropriate for the modem included with your system. For information on using your fax or telephone answering machine software (optional), see your fax software User's Guide.***

Connecting Your Modem

Follow the system setup procedure in **Chapter 2: Quick Start** or **Chapter 3: Setting Up** to connect your modem (optional) to your phone line and your system (if necessary).

Contacting the Telephone Company

With the deregulation of the telephone industry in 1987, you are no longer required to notify the telephone company before connecting your modem to your telephone line.

Your modem has been tested and complies with Part 68 of the FCC rules.

If you experience telephone line trouble after making this connection, however, disconnect your modem from your telephone line. Your local telephone company is not responsible for disturbances caused by non-telephone company equipment.

Verifying Your Modem's Connection

1. Turn on your computer. The modem will complete a self-test.

2. If you haven't already done so, load your communications software (Lotus Works, Prodigy, etc.) into your system, configure it for **COM1** (*if you're using an optional internal modem or external modem connected to optional **Serial Port B**) or **COM2** (if you're using an external modem connected to **Serial Port A**)*. Then place the computer in terminal or direct mode. For example, if your computer uses Windows:

   A. Click on its Terminal™ accessory icon (located in the Accessories group after you turn on the computer);

   B. Open the Settings menu;

   C. Click on the Communications menu option and specify the connector as **COM1 or COM2**. (This is one of several settings which you may need to specify. In many instances, the software's default values will work fine, and require no adjustment. For more information, consult your Windows or communications software manual.)

3. Type **AT** or **at**, followed by the **ENTER** key.

If your communications terminal program requests a modem type, you can select **Hayes Ultra 14400 or Intel 14.4 EX**. If necessary, you can type the following initialization string: **AT&FE1L1V1&C1&D2S0=0S7=90**. For more information, see your communications software program's user's guide.

If the modem is working properly, the **OK** response should appear on your monitor screen. If not, turn off your system and check your connection procedures. Also check your computer's transmission rate to your modem; it should be 300, 1200, 2400, 4800, 9600 or 14,400 bps (bits per second), and is adjustable via your communications software program. If you still have trouble after checking the modem connections and specifying the various settings to your communications software, contact Packard Bell Technical Support for assistance.

Operating Your Modem

Disabling Call Waiting

The call waiting service offered by many telephone companies can interfere with the modem in Data Mode. To prevent this, ask your local phone company how to temporarily disable call waiting.

Using Communication Software

To use your modem efficiently, you'll want to understand how your communications software works with it, since different communications software programs require different levels of interaction between you and your modem. If you haven't yet done so, read your communications software manual carefully, to discover how the program works.

Operating Modes

Your modem has two operating modes: Command Mode and Data Mode.

- In Command Mode, you **command** (send instructions to) your modem to perform a variety of functions, by typing them on your keyboard (see **page G-8**).

- In Data Mode, your modem actually **exchanges** commands or computer files across the telephone line with a computer at a remote location. When your modem is in data mode, it assumes that everything it receives from your computer is *data* which you want transferred, and sends it across the telephone line to the remote computer. Thus, avoid typing a command while your modem is in Data Mode.

The following sections describe *how to enter each operating mode and how to switch between them.*

Entering the Command Mode

Your modem automatically enters the Command Mode after:

- You turn on your computer.
- You lose the data connection with the remote modem -- which can occur when one modem fails to receive the carrier signal from the other modem. This can be intentional (such as when one modem hangs up) or unintentional (due to telephone line problems).
- The **&D1** command is in effect and the modem detects an ON-to-OFF transition on the Data Terminal Ready (DTR) interchange circuit -- if this happens, your modem returns to the Command Mode without hanging up. To hang up the modem, send the **H** command (or, if the **&D2** command is in effect, turn off the Data Terminal Ready interchange circuit).
- The **&D2** command is in effect and the modem detects an ON-to-OFF transition on the DTR interchange circuit -- if this happens, your modem hangs up and returns to the Command Mode.
- The **&D3** command is in effect and the modem detects an ON-to-OFF transition on the DTR interchange circuit -- if this happens, your modem hangs up, resets itself, obtains its operating parameters from its default characteristics or nonvolatile memory, and returns to the Command Mode.
- Touching any key on your computer keyboard while your modem is dialing -- your modem stops the call and hangs up automatically.

Additionally, if you reset the modem while it's in Command Mode, it remains in Command Mode; however, any data connection with a remote modem is terminated. (For more information about the reset function, see **Resetting Your Modem** in this appendix.)

Entering the Data Mode

Your modem automatically enters the Data Mode after making a data connection with another modem at a remote location. The two modems make the data connection using a process called *handshaking*.

Modems accomplish handshaking by sending high-pitched carrier tones across the telephone line. Your modem turns on the speaker when you place a call, but turns the speaker off during the handshaking and data connection. However, you can use the M2 command to keep the speaker on during the handshaking and data connection (see **page G-12**).

Returning to Command Mode and Keeping the Data Connection

When your modem is in the Data Mode, use the escape characters to return (escape to) the Command Mode without losing the data connection. *This feature is useful when you have established a data connection with a remote modem and want to check or change a setting on your modem, then immediately return to passing data.*

To use the escape characters:

1. After your modem has made an asynchronous data connection, **wait at least one second** without typing anything.

2. Type the escape characters (default is +++).

3. Wait at least one second.

Your modem responds with either the word response **OK**, or the number response 0, and enters the Command Mode while keeping the data connection. It continues to send the carrier signal, and stays connected to the remote modem as long as the remote modem doesn't disconnect from the line or stop sending its carrier signal.

Returning to Data Mode

When you want to leave Command Mode and resume passing data, type **ATO** in upper-case letters and press the **ENTER** key. Your modem sends an appropriate **CONNECT** response and returns to the Data Mode.

Register **S2** sets the value of the escape characters. Register **S12** defines how long you must wait both before and after typing the escape characters. For more information on registers, see **page G-23**.

NOTE

If the **&D2** command is in effect and you use the +++ characters to enter the Command Mode, an ON-to-OFF transition on the DTR interchange circuit has the same effect as the **H** command.

Resetting Your Modem

There are three ways to reset your modem:

- Sending the **Z** command from your computer (see **page G-13**).
- Sending an **&D3** command, then experiencing an ON-to-OFF transition on the DTR interchange circuit.
- Turning your computer off, then on.

Any of these actions causes the following actions to occur:

- If your modem was off-hook, it goes on-hook (hangs up).
- The last command executed by your modem is deleted from the modem's memory. *(This eliminates the usefulness of the A/ command.)*
- Your modem remains in the Command Mode.

Do not send any commands to your modem until at least one second after resetting it.

Character Format

To communicate asynchronously with another modem, the character length of your system must match that of the remote asynchronous system. Character format is adjustable through your communications software program (see your software user's guide).

Table G-1 shows the valid character formats.

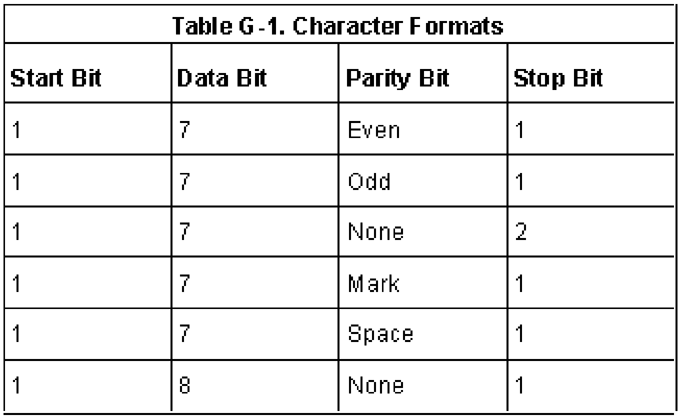


Table G-1. Character Formats

Start Bit	Data Bit	Parity Bit	Stop Bit
1	7	Even	1
1	7	Odd	1
1	7	None	2
1	7	Mark	1
1	7	Space	1
1	8	None	1

Transmission Speeds

Transmission speed is governed by the speed of the system that you want to communicate with. You must set the transmission speed of your computer or terminal either by setting a switch in the hardware, or by issuing a software command. See your communications software documentation to learn its range of transmission speeds and how to set the speed. *(After the connection is made, you cannot change the transmission speed with a modem command.)*

When the modem originates a call, it automatically detects and adjusts to the transmission speed set in your equipment. Your modem uses the **AT** (Attention) characters of a command to determine the transmission speed, word length, and parity of the device that it is connected to.

When your modem *answers* a call, it determines the transmission speed from the carrier signal of the originating modem. If the **X1, X2, X3, or X4** command is in effect, the modem informs you of the rate of the call it answered. If your system is using different operating characteristics than those of the remote system, change the setting of your equipment to match the remote system. Otherwise, unintelligible data will appear on your screen.

When your modem makes a connection with a remote modem, it sends you a **CONNECT** response at the default rate of either 2400, 9600 or 14,400 bits per second (depending on your system's modem), unless you have changed the speed. You'll receive subsequent responses either at the speed of the remote system (if your modem answered the call) or the speed at which you sent the AT characters (if you originated the call).

Sending Commands

You can have your modem perform a variety of functions by sending it instructions (commands). *Commands* are letters, numbers, and punctuation marks that tell the modem to perform various functions. Sending a command temporarily overrides the modem's operating characteristics obtained from its default characteristics or nonvolatile memory.

How to Type and Execute Commands

Your modem must be in the Command Mode to execute a command. If you send a command when the modem is in the Data Mode, the modem interprets the command characters as data to be sent to the remote location, and sends them across the telephone line.

To learn how to put your modem in Command Mode, see **Entering the Command Mode on page G-4**.

Once your modem is in the Command Mode, you can send a command (or commands) to your modem by typing a command line.

NOTE Your modem can accept commands from your computer at 300, 1200, 2400, 4800, 9600 or 14,400 bps (depending on your modem). Make sure your computer is using one of these speeds when sending commands.

To type a command line and have your modem execute it:

1. With your modem in Command Mode, type **AT** or **at**. *These attention characters **must** be typed at the beginning of each command line.* You can type them as **AT** or **at**, but not **aT** or **At**.

NOTE *__AT__ deletes the last command line executed by your modem (if any) from the modem's memory, and prepares your modem for the new command line.*

2. Type the command(s) in either upper-case or lower-case letters. Include any parameters required by the command. (To make the command line more readable, you can insert as many spaces as desired. The command line holds up to 40 characters, excluding the **AT** prefix and any spaces.)

NOTE *To enhance readability, you can include hyphens and parentheses. However, these characters apply to the 40-character limit.*

3. Press the **ENTER** key. Your modem executes the command line and sends you a word response (usually, **OK**) or a number response (usually, **0**).

After executing the command line, the modem saves it in memory so that you can re-use it (see **Automatically Re-executing the Last Command Line**).

NOTE *To send more than one command line, wait for the __OK__ or __0__ response before typing the __AT__ prefix at the start of the next command line.*

Automatically Re-executing the Last Command Line

To automatically re-execute the last command line executed, type **A/** in upper-case or lower-case letters while your modem is in Command Mode. (You don't have to type AT before typing A/, or press the **ENTER** key to execute this command.)

A/ is especially useful when you want to redial a number that was busy, or re-execute a long command line.

You can continue using **A/** to automatically re-execute the last command line your modem executed until any of the following occurs:

- You type a new command line that begins with **AT**.
- Your modem loses power.
- You reset your modem.

Any of these actions deletes the last executed command from memory (invalidating the **A/** command, since there is no command to re-execute).

Standard Commands

Table G-2 alphabetically lists the standard commands. The default values appear in **bold.**

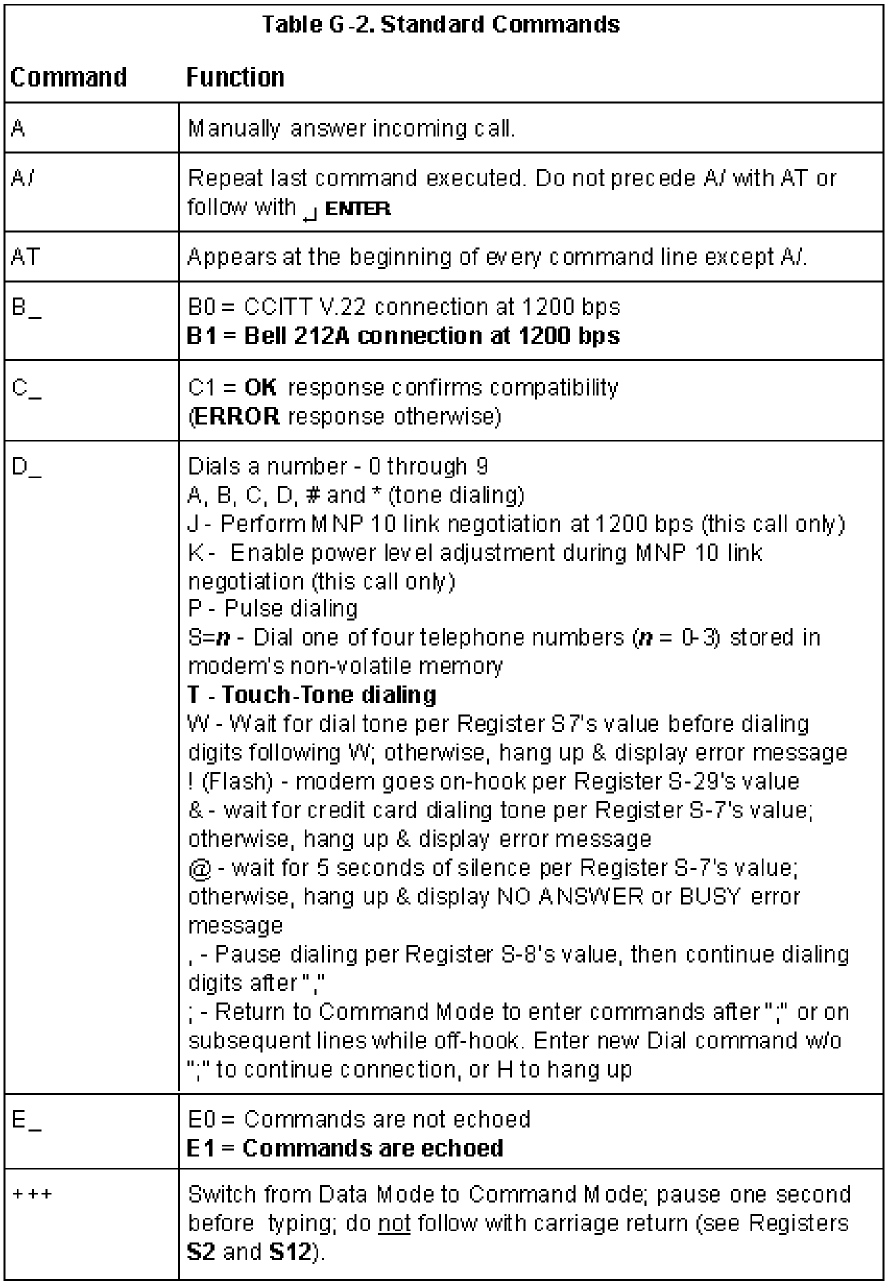


Table G-2. Standard Commands

Command	Function
A	Manually answer incoming call.
A/	Repeat last command executed. Do not precede A/ with AT or follow with ↵ **ENTER**
AT	Appears at the beginning of every command line except A/.
B_	B0 = CCITT V.22 connection at 1200 bps **B1 = Bell 212A connection at 1200 bps**
C_	C1 = **OK** response confirms compatibility (**ERROR** response otherwise)
D_	Dials a number - 0 through 9 A, B, C, D, # and * (tone dialing) J - Perform MNP 10 link negotiation at 1200 bps (this call only) K - Enable power level adjustment during MNP 10 link negotiation (this call only) P - Pulse dialing S=***n*** - Dial one of four telephone numbers (***n*** = 0-3) stored in modem's non-volatile memory **T - Touch-Tone dialing** W - Wait for dial tone per Register S7's value before dialing digits following W; otherwise, hang up & display error message ! (Flash) - modem goes on-hook per Register S-29's value & - wait for credit card dialing tone per Register S-7's value; otherwise, hang up & display error message @ - wait for 5 seconds of silence per Register S-7's value; otherwise, hang up & display NO ANSWER or BUSY error message , - Pause dialing per Register S-8's value, then continue dialing digits after "," ; - Return to Command Mode to enter commands after ";" or on subsequent lines while off-hook. Enter new Dial command w/o ";" to continue connection, or H to hang up
E_	E0 = Commands are not echoed **E1 = Commands are echoed**
+++	Switch from Data Mode to Command Mode; pause one second before typing; do not follow with carriage return (see Registers **S2** and **S12**).

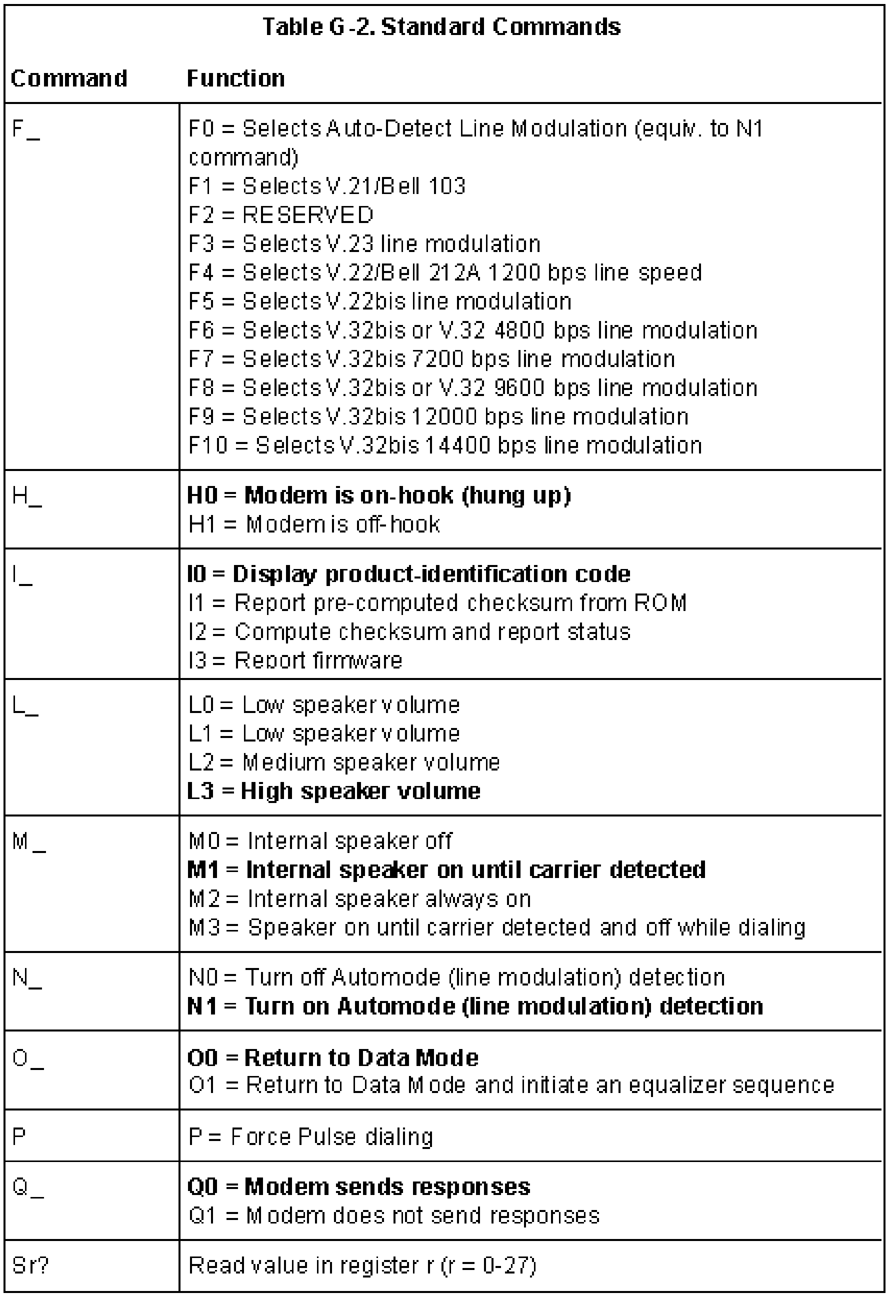


Table G-2. Standard Commands

Command	Function
F_	F0 = Selects Auto-Detect Line Modulation (equiv. to N1 command) F1 = Selects V.21/Bell 103 F2 = RESERVED F3 = Selects V.23 line modulation F4 = Selects V.22/Bell 212A 1200 bps line speed F5 = Selects V.22bis line modulation F6 = Selects V.32bis or V.32 4800 bps line modulation F7 = Selects V.32bis 7200 bps line modulation F8 = Selects V.32bis or V.32 9600 bps line modulation F9 = Selects V.32bis 12000 bps line modulation F10 = Selects V.32bis 14400 bps line modulation
H_	**H0 = Modem is on-hook (hung up)** H1 = Modem is off-hook
I_	**I0 = Display product-identification code** I1 = Report pre-computed checksum from ROM I2 = Compute checksum and report status I3 = Report firmware
L_	L0 = Low speaker volume L1 = Low speaker volume L2 = Medium speaker volume **L3 = High speaker volume**
M_	M0 = Internal speaker off **M1 = Internal speaker on until carrier detected** M2 = Internal speaker always on M3 = Speaker on until carrier detected and off while dialing
N_	N0 = Turn off Automode (line modulation) detection **N1 = Turn on Automode (line modulation) detection**
O_	**O0 = Return to Data Mode** O1 = Return to Data Mode and initiate an equalizer sequence
P	P = Force Pulse dialing
Q_	**Q0 = Modem sends responses** Q1 = Modem does not send responses
Sr?	Read value in register r (r = 0-27)

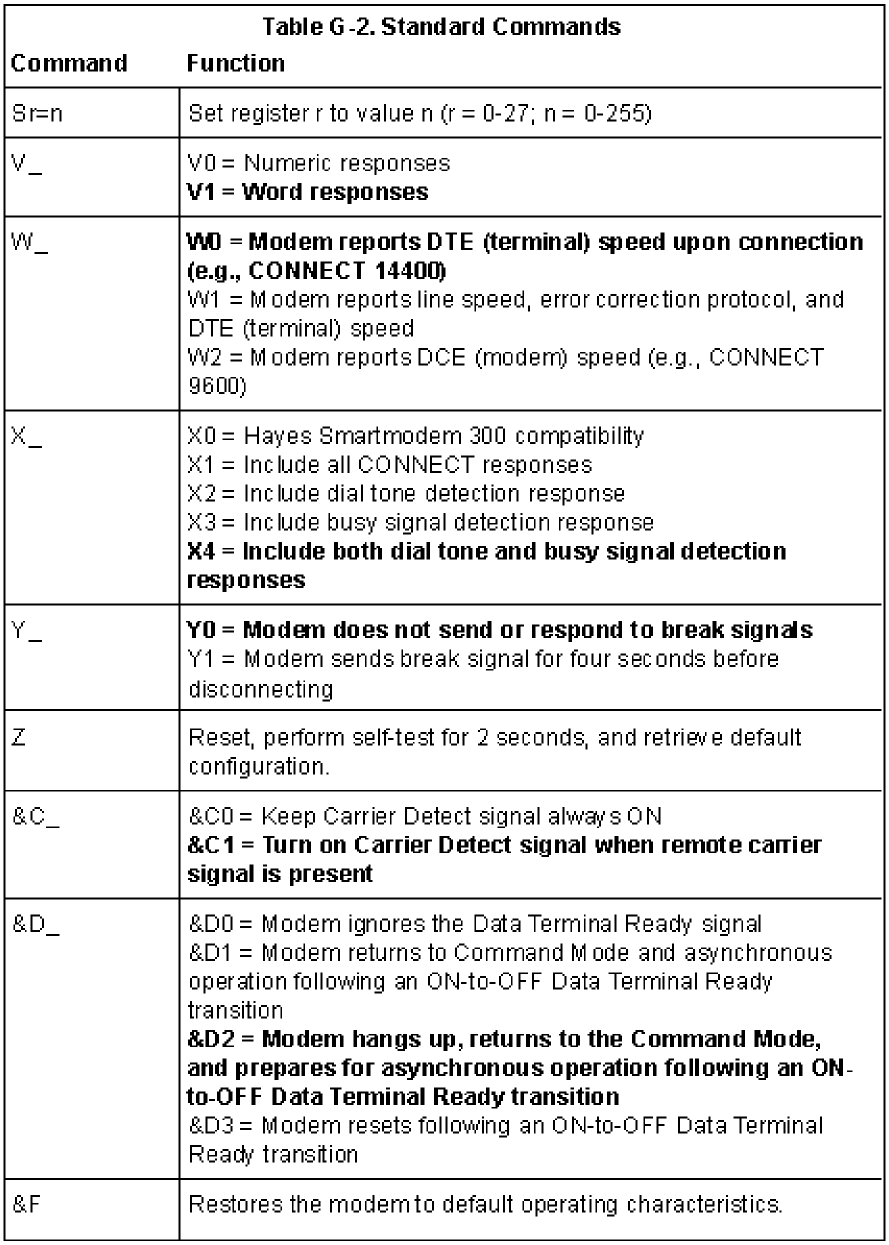


Table G-2. Standard Commands

Command	**Function**
Sr=n	Set register r to value n (r = 0-27; n = 0-255)
V_	V0 = Numeric responses **V1 = Word responses**
W_	**W0 = Modem reports DTE (terminal) speed upon connection (e.g., CONNECT 14400)** W1 = Modem reports line speed, error correction protocol, and DTE (terminal) speed W2 = Modem reports DCE (modem) speed (e.g., CONNECT 9600)
X_	X0 = Hayes Smartmodem 300 compatibility X1 = Include all CONNECT responses X2 = Include dial tone detection response X3 = Include busy signal detection response **X4 = Include both dial tone and busy signal detection responses**
Y_	**Y0 = Modem does not send or respond to break signals** Y1 = Modem sends break signal for four seconds before disconnecting
Z	Reset, perform self-test for 2 seconds, and retrieve default configuration.
&C_	&C0 = Keep Carrier Detect signal always ON **&C1 = Turn on Carrier Detect signal when remote carrier signal is present**
&D_	&D0 = Modem ignores the Data Terminal Ready signal &D1 = Modem returns to Command Mode and asynchronous operation following an ON-to-OFF Data Terminal Ready transition **&D2 = Modem hangs up, returns to the Command Mode, and prepares for asynchronous operation following an ON-to-OFF Data Terminal Ready transition** &D3 = Modem resets following an ON-to-OFF Data Terminal Ready transition
&F	Restores the modem to default operating characteristics.

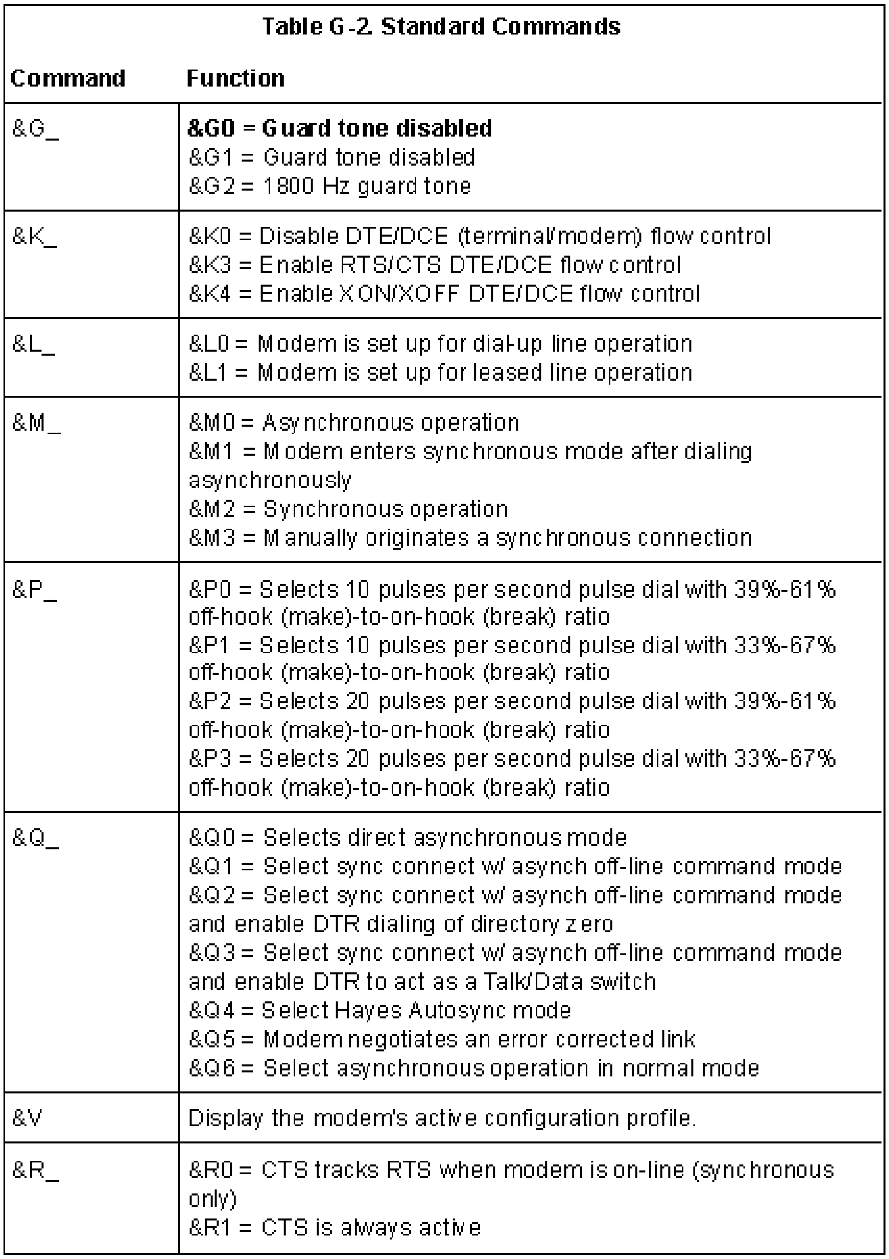


Table G-2. Standard Commands

Command	Function
&G_	**&G0 = Guard tone disabled** &G1 = Guard tone disabled &G2 = 1800 Hz guard tone
&K_	&K0 = Disable DTE/DCE (terminal/modem) flow control &K3 = Enable RTS/CTS DTE/DCE flow control &K4 = Enable XON/XOFF DTE/DCE flow control
&L_	&L0 = Modem is set up for dial-up line operation &L1 = Modem is set up for leased line operation
&M_	&M0 = Asynchronous operation &M1 = Modem enters synchronous mode after dialing asynchronously &M2 = Synchronous operation &M3 = Manually originates a synchronous connection
&P_	&P0 = Selects 10 pulses per second pulse dial with 39%-61% off-hook (make)-to-on-hook (break) ratio &P1 = Selects 10 pulses per second pulse dial with 33%-67% off-hook (make)-to-on-hook (break) ratio &P2 = Selects 20 pulses per second pulse dial with 39%-61% off-hook (make)-to-on-hook (break) ratio &P3 = Selects 20 pulses per second pulse dial with 33%-67% off-hook (make)-to-on-hook (break) ratio
&Q_	&Q0 = Selects direct asynchronous mode &Q1 = Select sync connect w/ asynch off-line command mode &Q2 = Select sync connect w/ asynch off-line command mode and enable DTR dialing of directory zero &Q3 = Select sync connect w/ asynch off-line command mode and enable DTR to act as a Talk/Data switch &Q4 = Select Hayes Autosync mode &Q5 = Modem negotiates an error corrected link &Q6 = Select asynchronous operation in normal mode
&V	Display the modem's active configuration profile.
&R_	&R0 = CTS tracks RTS when modem is on-line (synchronous only) &R1 = CTS is always active

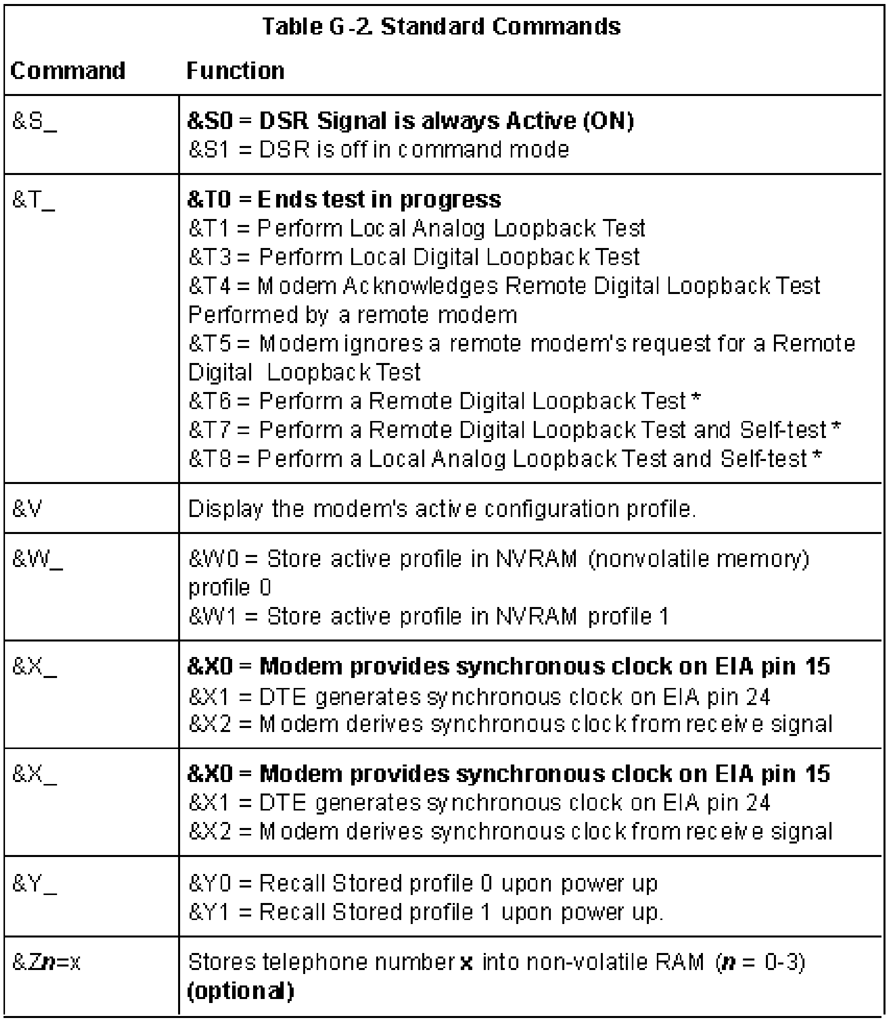


Table G-2. Standard Commands

Command	Function
&S_	**&S0 = DSR Signal is always Active (ON)** &S1 = DSR is off in command mode
&T_	**&T0 = Ends test in progress** &T1 = Perform Local Analog Loopback Test &T3 = Perform Local Digital Loopback Test &T4 = Modem Acknowledges Remote Digital Loopback Test Performed by a remote modem &T5 = Modem ignores a remote modem's request for a Remote Digital Loopback Test &T6 = Perform a Remote Digital Loopback Test * &T7 = Perform a Remote Digital Loopback Test and Self-test * &T8 = Perform a Local Analog Loopback Test and Self-test *
&V	Display the modem's active configuration profile.
&W_	&W0 = Store active profile in NVRAM (nonvolatile memory) profile 0 &W1 = Store active profile in NVRAM profile 1
&X_	**&X0 = Modem provides synchronous clock on EIA pin 15** &X1 = DTE generates synchronous clock on EIA pin 24 &X2 = Modem derives synchronous clock from receive signal
&X_	**&X0 = Modem provides synchronous clock on EIA pin 15** &X1 = DTE generates synchronous clock on EIA pin 24 &X2 = Modem derives synchronous clock from receive signal
&Y_	&Y0 = Recall Stored profile 0 upon power up &Y1 = Recall Stored profile 1 upon power up.
&Z*n*=x	Stores telephone number **x** into non-volatile RAM (***n*** = 0-3) **(optional)**

Command Troubleshooting

If your modem did not execute a command line, make sure that you typed **AT** or **at** and you were *in the Command Mode* when you typed the command line and pressed the **ENTER key**; otherwise, the modem will not execute your command line.

If you received an **ERROR or 4** response after typing a command line and pressing the **ENTER Key**, make sure:

Your command line contains fewer than 40 characters (excluding the AT prefix and any spaces). Remember that hyphens and parentheses count as characters.

If your command line meets these requirements, you can verify whether your modem is receiving your command line accurately by having your modem echo the command line back to your computer. Echoing is turned on with the **E1** command. Your modem is shipped from the factory with the echo feature turned on. For more information on the **E** command, see **page G-11**.

Correcting a Typing Mistake

If you make a mistake while typing a command, you can delete the error by pressing the **BACKSPACE** key. Pressing **BACKSPACE** once deletes the last character you entered. However, BACKSPACE will not delete the **AT** at the beginning of the command line.

NOTE

You can change the **BACKSPACE** character to another ASCII character by changing the value of the **S5** register (see **page G-23**).

Deleting a Command Line

If you type a command and then decide to delete the entire command line:

1. Press the **BACKSPACE** key until every command character except **AT** is deleted.
2. Press the **ENTER** key.

You should receive a response of either **OK or 0**.

Responses

Overview

Your modem sends you an asynchronous response when you send a command line. The response is taken from one of five groups (sets), depending on your preference. For example, if your modem successfully executes a command line, it may send you the **OK** response.

Responses can appear as words or as numbers. Your modem is initially set up to return word responses. Word responses are preceded and followed by a carriage return and line feed. A carriage return/line feed automatically moves the cursor to the beginning of the next line.

If your modem is operating under a programming language that cannot handle character strings (or handles them inefficiently), you may want to use the **V0** command to have your modem return number responses.

Alternatively, you can use the **Q1** command to prevent the modem from sending responses. (You may not want to receive responses, for example, if the modem is connected to a printer.)

Response Sets

You can select responses from any of five response sets:

- The **X0** response set provides compatibility with the Hayes 300 bps Smartmodem. It consists of the first five responses in Table G-3 and the **NO ANSWER** response. With this response set, you receive the **CONNECT** response for all connections, regardless of the speed at which they are made. In addition, the modem *blind dials* (waits two seconds after receiving your Dial command, then automatically dials the telephone number without ensuring that a dial tone is present). Blind dialing may be useful if you are using the modem in an area that has an irregular or weak dial tone that your modem cannot detect.

- The **X1** response set provides compatibility with the Hayes 2400 bps Smartmodem. It includes all of the **X0** responses and provides the responses **CONNECT 1200** and **CONNECT 2400**, which inform you of the connection speed. This response set also provides for blind dialing.

- The **X2** response set consists of all the responses in the **X1** response set, and adds the **NO DIALTONE** response. When you send your modem a Dial command with the **X2** response set in effect, your modem listens for a dial tone before dialing. If it does not detect a dial tone within five seconds, it hangs up and returns the **NO DIALTONE** response.

- The **X3** response set consists of all the responses in the **X1** response set, and adds the **BUSY** response, which the modem sends when it dials a telephone number that's busy. This response set also provides for blind dialing.

- The **X4** response set is the factory default setting. It consists of all the responses in the **X1** response set, and adds the **NO DIALTONE** and **BUSY** responses, so that the modem can detect a dial tone and busy signal.

Table G-3 shows the responses and the sets they belong to.

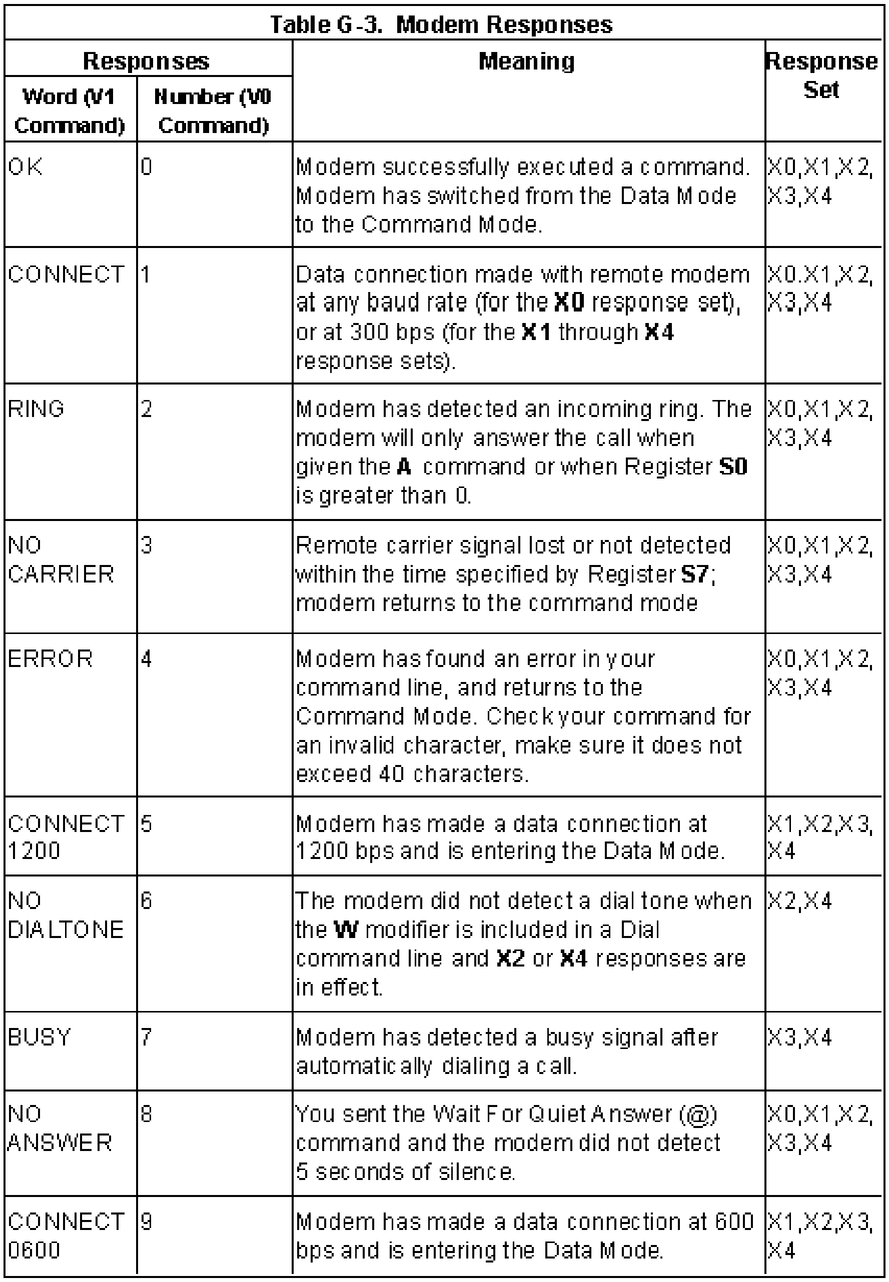


Table G-3. Modem Responses

Responses		Meaning	Response Set
Word (V1 Command)	**Number (V0 Command)**		
OK	0	Modem successfully executed a command. Modem has switched from the Data Mode to the Command Mode.	X0,X1,X2, X3,X4
CONNECT	1	Data connection made with remote modem at any baud rate (for the **X0** response set), or at 300 bps (for the **X1** through **X4** response sets).	X0.X1,X2, X3,X4
RING	2	Modem has detected an incoming ring. The modem will only answer the call when given the **A** command or when Register **S0** is greater than 0.	X0,X1,X2, X3,X4
NO CARRIER	3	Remote carrier signal lost or not detected within the time specified by Register **S7**; modem returns to the command mode	X0,X1,X2, X3,X4
ERROR	4	Modem has found an error in your command line, and returns to the Command Mode. Check your command for an invalid character, make sure it does not exceed 40 characters.	X0,X1,X2, X3,X4
CONNECT 1200	5	Modem has made a data connection at 1200 bps and is entering the Data Mode.	X1,X2,X3, X4
NO DIALTONE	6	The modem did not detect a dial tone when the **W** modifier is included in a Dial command line and **X2** or **X4** responses are in effect.	X2,X4
BUSY	7	Modem has detected a busy signal after automatically dialing a call.	X3,X4
NO ANSWER	8	You sent the Wait For Quiet Answer (@) command and the modem did not detect 5 seconds of silence.	X0,X1,X2, X3,X4
CONNECT 0600	9	Modem has made a data connection at 600 bps and is entering the Data Mode.	X1,X2,X3, X4

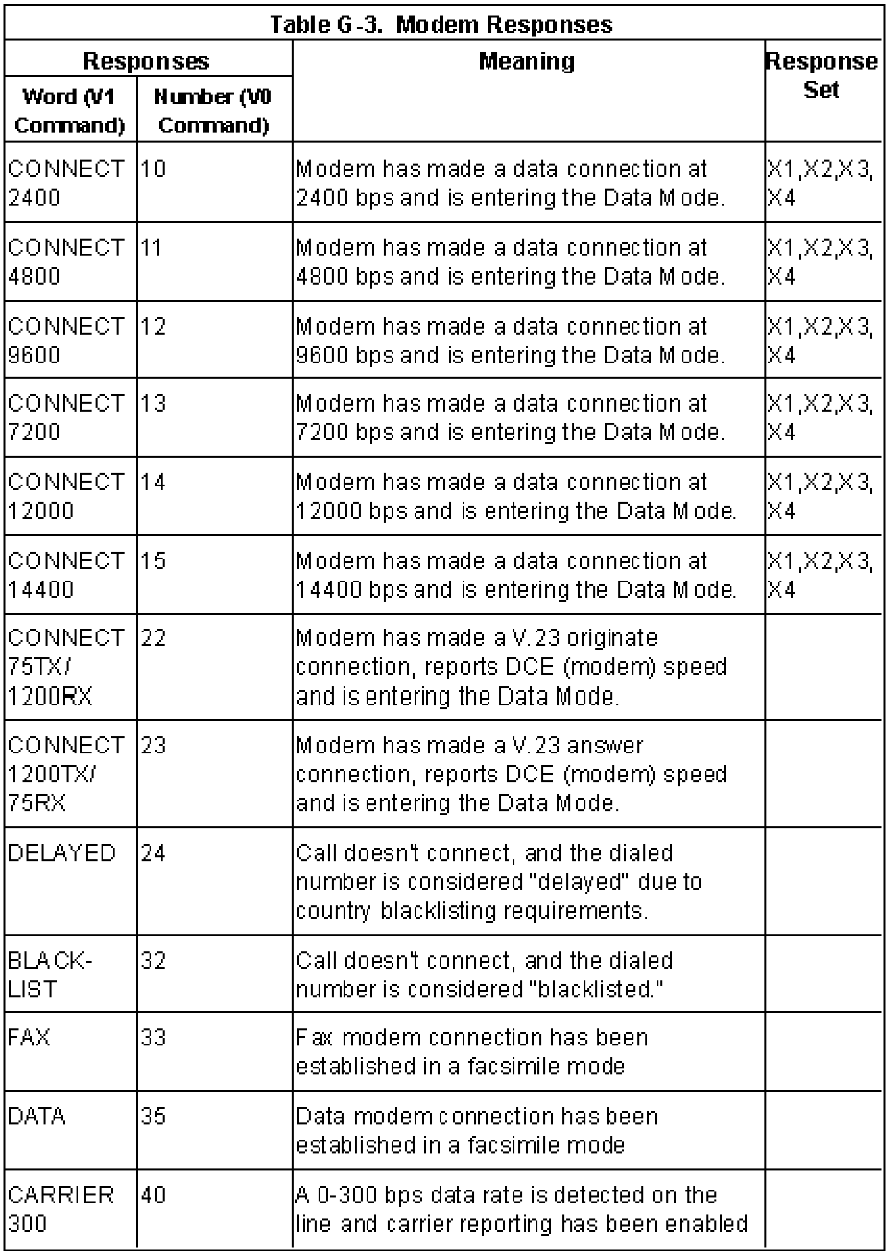


Table G-3. Modem Responses

Responses		Meaning	Response Set
Word (V1 Command)	Number (V0 Command)		
CONNECT 2400	10	Modem has made a data connection at 2400 bps and is entering the Data Mode.	X1,X2,X3, X4
CONNECT 4800	11	Modem has made a data connection at 4800 bps and is entering the Data Mode.	X1,X2,X3, X4
CONNECT 9600	12	Modem has made a data connection at 9600 bps and is entering the Data Mode.	X1,X2,X3, X4
CONNECT 7200	13	Modem has made a data connection at 7200 bps and is entering the Data Mode.	X1,X2,X3, X4
CONNECT 12000	14	Modem has made a data connection at 12000 bps and is entering the Data Mode.	X1,X2,X3, X4
CONNECT 14400	15	Modem has made a data connection at 14400 bps and is entering the Data Mode.	X1,X2,X3, X4
CONNECT 75TX/ 1200RX	22	Modem has made a V.23 originate connection, reports DCE (modem) speed and is entering the Data Mode.	
CONNECT 1200TX/ 75RX	23	Modem has made a V.23 answer connection, reports DCE (modem) speed and is entering the Data Mode.	
DELAYED	24	Call doesn't connect, and the dialed number is considered "delayed" due to country blacklisting requirements.	
BLACK-LIST	32	Call doesn't connect, and the dialed number is considered "blacklisted."	
FAX	33	Fax modem connection has been established in a facsimile mode	
DATA	35	Data modem connection has been established in a facsimile mode	
CARRIER 300	40	A 0-300 bps data rate is detected on the line and carrier reporting has been enabled	

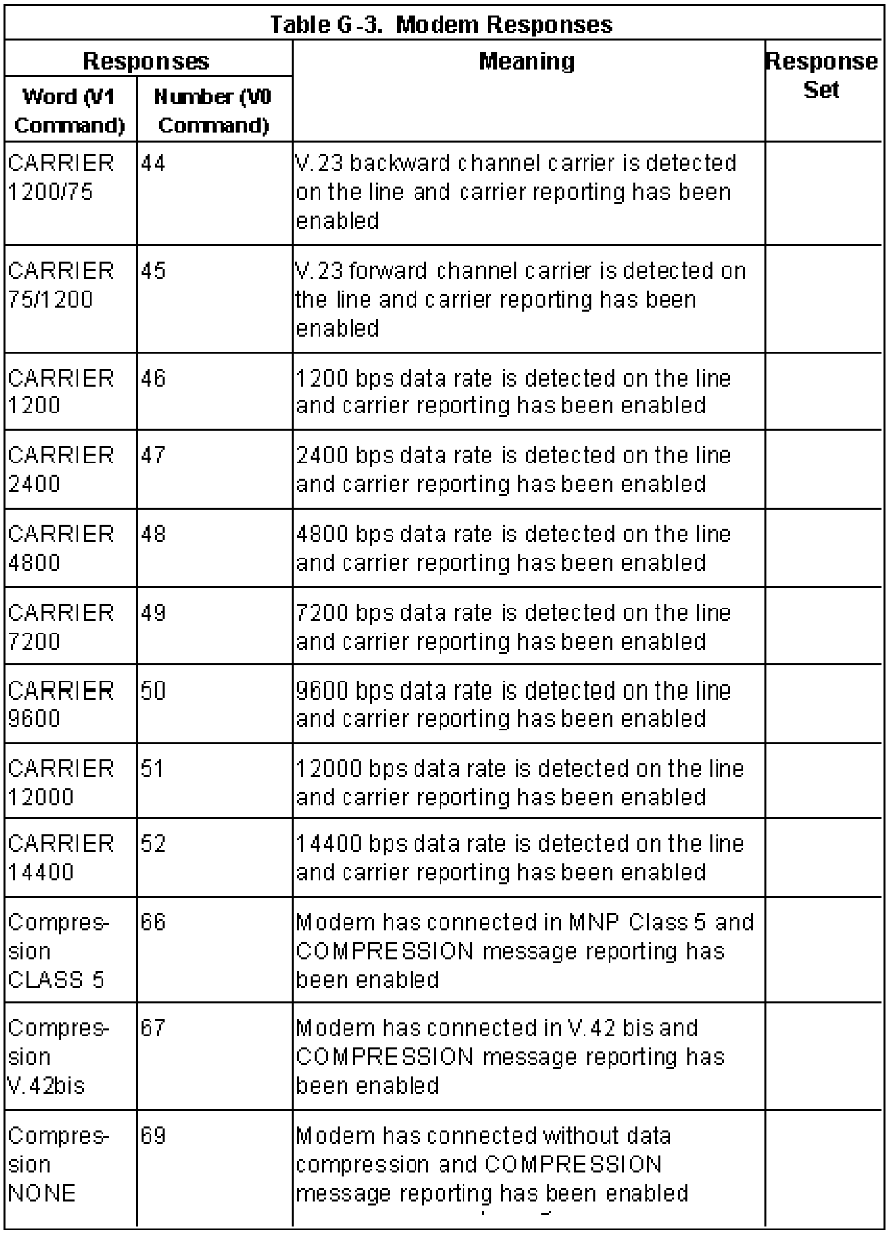


Table G-3. Modem Responses

Responses		Meaning	Response Set
Word (V1 Command)	Number (V0 Command)		
CARRIER 1200/75	44	V.23 backward channel carrier is detected on the line and carrier reporting has been enabled	
CARRIER 75/1200	45	V.23 forward channel carrier is detected on the line and carrier reporting has been enabled	
CARRIER 1200	46	1200 bps data rate is detected on the line and carrier reporting has been enabled	
CARRIER 2400	47	2400 bps data rate is detected on the line and carrier reporting has been enabled	
CARRIER 4800	48	4800 bps data rate is detected on the line and carrier reporting has been enabled	
CARRIER 7200	49	7200 bps data rate is detected on the line and carrier reporting has been enabled	
CARRIER 9600	50	9600 bps data rate is detected on the line and carrier reporting has been enabled	
CARRIER 12000	51	12000 bps data rate is detected on the line and carrier reporting has been enabled	
CARRIER 14400	52	14400 bps data rate is detected on the line and carrier reporting has been enabled	
Compression CLASS 5	66	Modem has connected in MNP Class 5 and COMPRESSION message reporting has been enabled	
Compression V.42bis	67	Modem has connected in V.42 bis and COMPRESSION message reporting has been enabled	
Compression NONE	69	Modem has connected without data compression and COMPRESSION message reporting has been enabled	

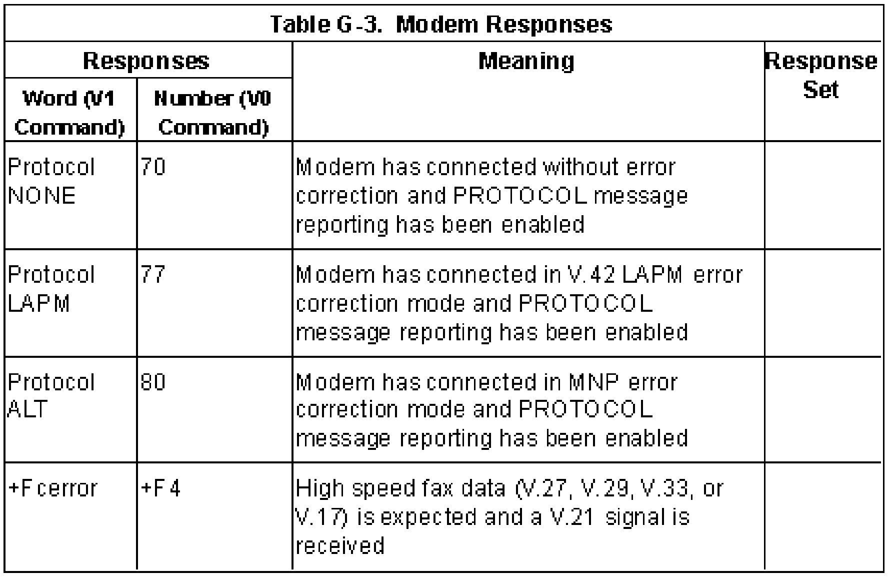


Table G-3. Modem Responses

Responses		Meaning	Response Set
Word (V1 Command)	Number (V0 Command)		
Protocol NONE	70	Modem has connected without error correction and PROTOCOL message reporting has been enabled	
Protocol LAPM	77	Modem has connected in V.42 LAPM error correction mode and PROTOCOL message reporting has been enabled	
Protocol ALT	80	Modem has connected in MNP error correction mode and PROTOCOL message reporting has been enabled	
+Fcerror	+F4	High speed fax data (V.27, V.29, V.33, or V.17) is expected and a V.21 signal is received	

Registers

Your modem has 53 registers, designated **S0** through **S46, S48, S82, S86, S91-92, and S95**. These registers affect various operating characteristics, let you obtain information about your modem, and test your modem. Except for *bit-mapped* and *undefined registers*, each register has a default value, which you can read or change. Table G-4 shows the registers, their functions, and their default values. Some registers can have their values changed by commands. If you use a command to change a register value, the command remains in effect until you turn off or reset your modem. Your modem then reverts to the operating characteristics specified in its default settings or nonvolatile memory.

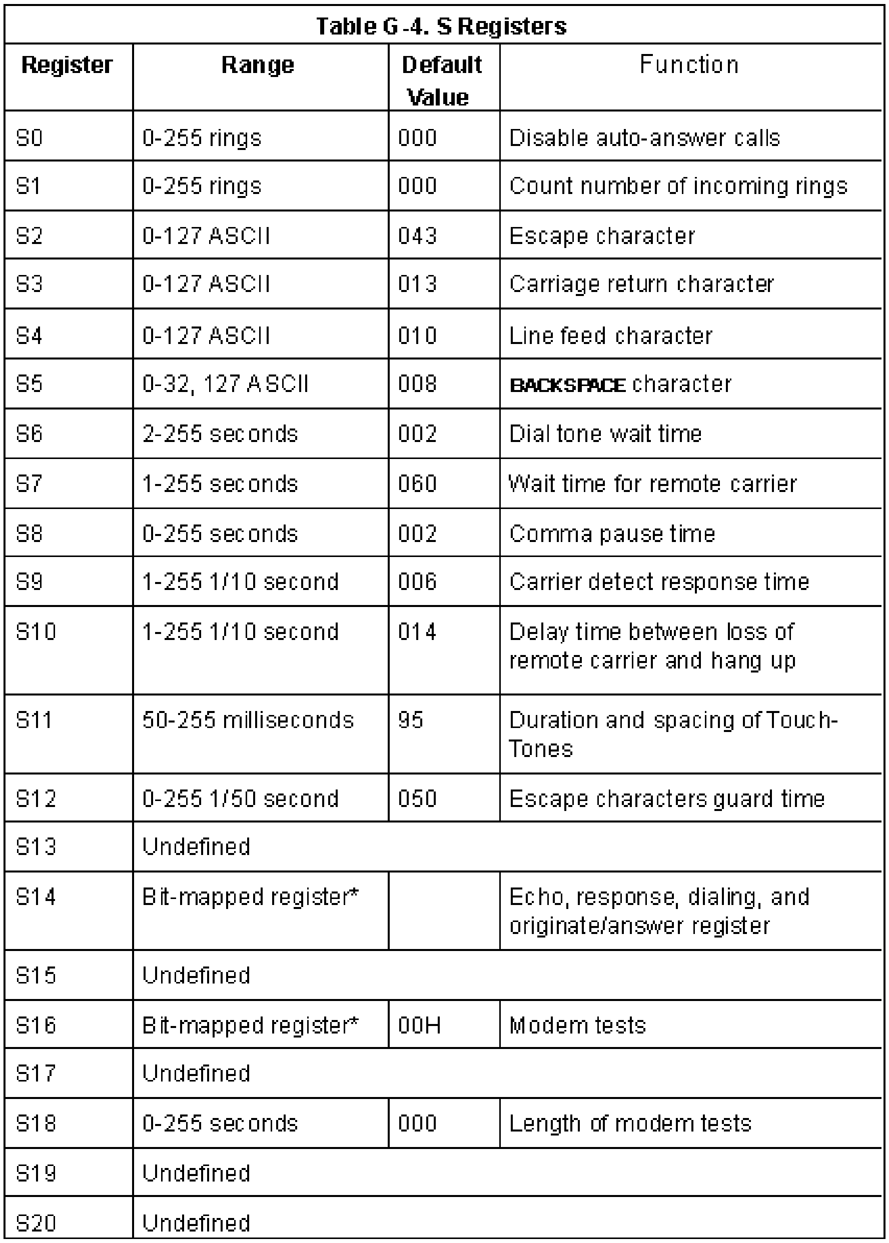


Table G-4. S Registers

Register	Range	Default Value	Function
S0	0-255 rings	000	Disable auto-answer calls
S1	0-255 rings	000	Count number of incoming rings
S2	0-127 ASCII	043	Escape character
S3	0-127 ASCII	013	Carriage return character
S4	0-127 ASCII	010	Line feed character
S5	0-32, 127 ASCII	008	**BACKSPACE** character
S6	2-255 seconds	002	Dial tone wait time
S7	1-255 seconds	060	Wait time for remote carrier
S8	0-255 seconds	002	Comma pause time
S9	1-255 1/10 second	006	Carrier detect response time
S10	1-255 1/10 second	014	Delay time between loss of remote carrier and hang up
S11	50-255 milliseconds	95	Duration and spacing of Touch-Tones
S12	0-255 1/50 second	050	Escape characters guard time
S13	Undefined		
S14	Bit-mapped register*		Echo, response, dialing, and originate/answer register
S15	Undefined		
S16	Bit-mapped register*	00H	Modem tests
S17	Undefined		
S18	0-255 seconds	000	Length of modem tests
S19	Undefined		
S20	Undefined		

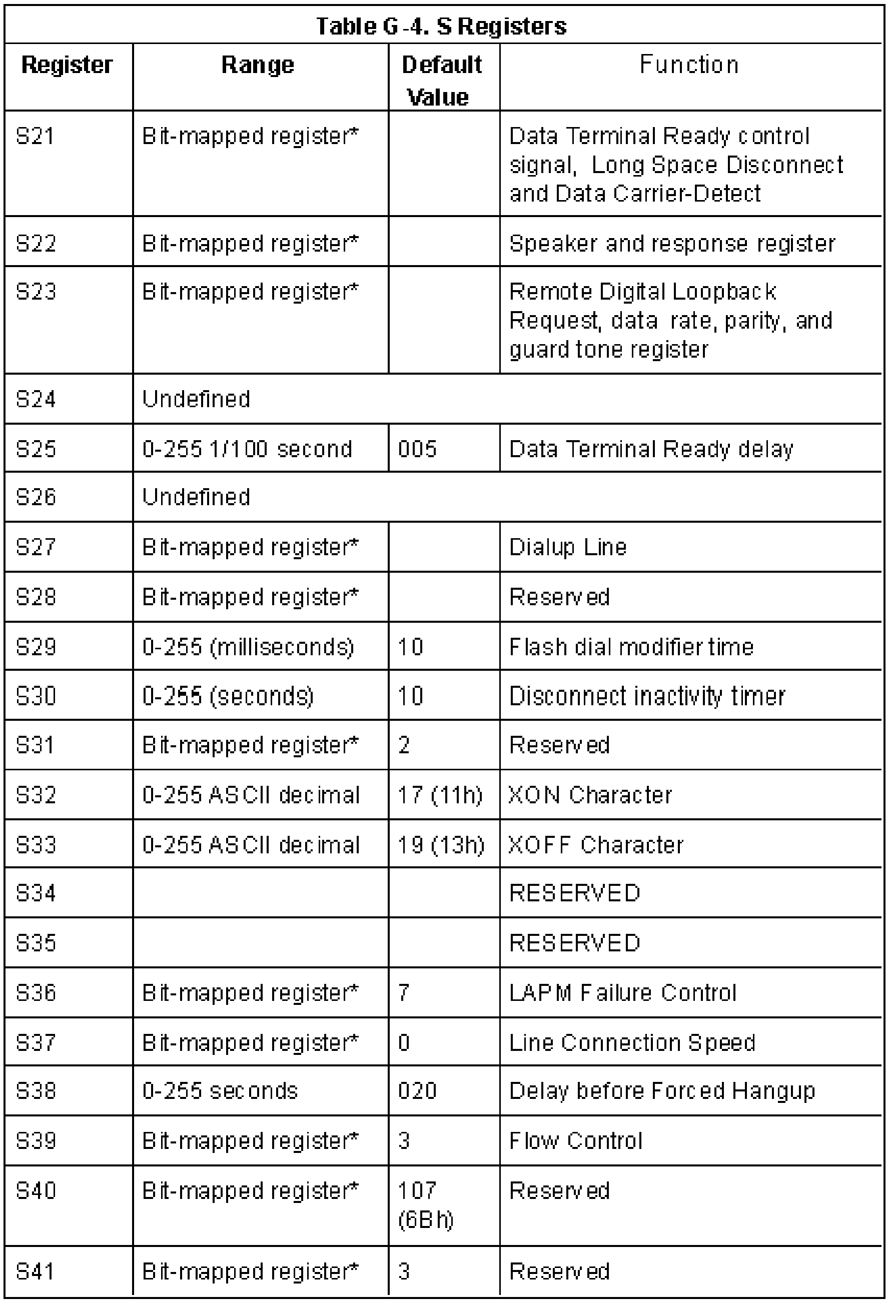


Table G-4. S Registers

Register	Range	Default Value	Function
S21	Bit-mapped register*		Data Terminal Ready control signal, Long Space Disconnect and Data Carrier-Detect
S22	Bit-mapped register*		Speaker and response register
S23	Bit-mapped register*		Remote Digital Loopback Request, data rate, parity, and guard tone register
S24	Undefined		
S25	0-255 1/100 second	005	Data Terminal Ready delay
S26	Undefined		
S27	Bit-mapped register*		Dialup Line
S28	Bit-mapped register*		Reserved
S29	0-255 (milliseconds)	10	Flash dial modifier time
S30	0-255 (seconds)	10	Disconnect inactivity timer
S31	Bit-mapped register*	2	Reserved
S32	0-255 ASCII decimal	17 (11h)	XON Character
S33	0-255 ASCII decimal	19 (13h)	XOFF Character
S34			RESERVED
S35			RESERVED
S36	Bit-mapped register*	7	LAPM Failure Control
S37	Bit-mapped register*	0	Line Connection Speed
S38	0-255 seconds	020	Delay before Forced Hangup
S39	Bit-mapped register*	3	Flow Control
S40	Bit-mapped register*	107 (6Bh)	Reserved
S41	Bit-mapped register*	3	Reserved

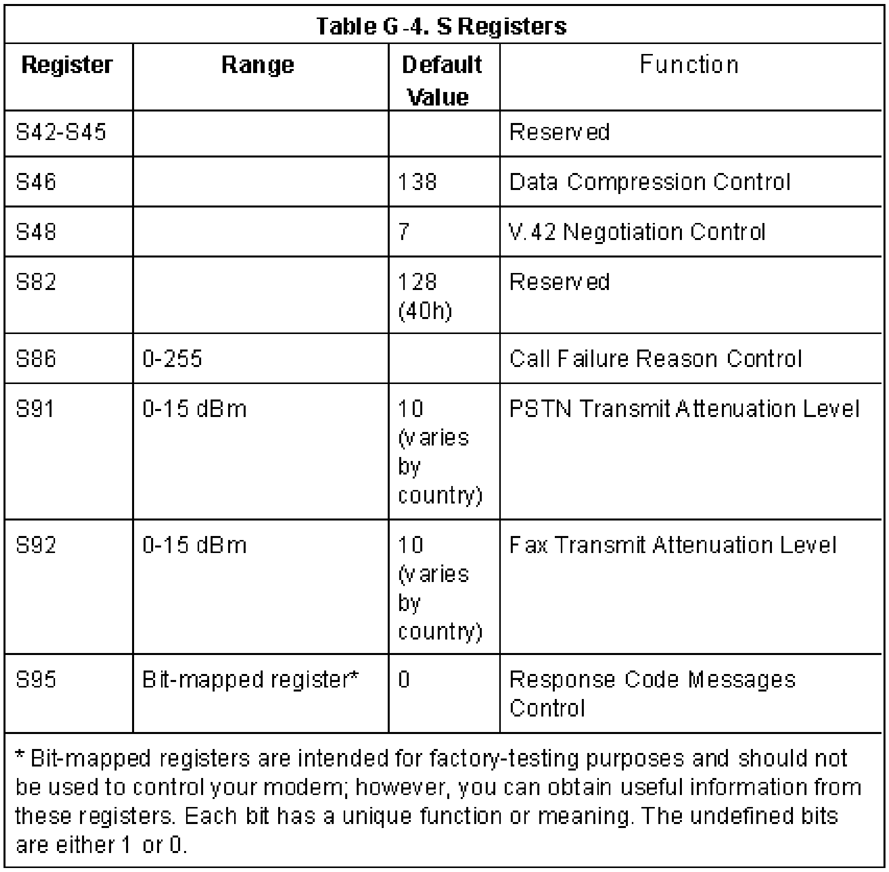


Table G-4. S Registers

Register	Range	Default Value	Function
S42-S45			Reserved
S46		138	Data Compression Control
S48		7	V.42 Negotiation Control
S82		128 (40h)	Reserved
S86	0-255		Call Failure Reason Control
S91	0-15 dBm	10 (varies by country)	PSTN Transmit Attenuation Level
S92	0-15 dBm	10 (varies by country)	Fax Transmit Attenuation Level
S95	Bit-mapped register*	0	Response Code Messages Control

* Bit-mapped registers are intended for factory-testing purposes and should not be used to control your modem; however, you can obtain useful information from these registers. Each bit has a unique function or meaning. The undefined bits are either 1 or 0.

Reading a Register Value

To read the current value of a register:

1. Type **AT Sr?** with r being the register number (0-95).

2. Press **ENTER**. Your modem responds with the decimal value of the register, in three-digit form.

To read values from more than one register:

3. Type **AT Sr? Sr?** from the Command Mode.

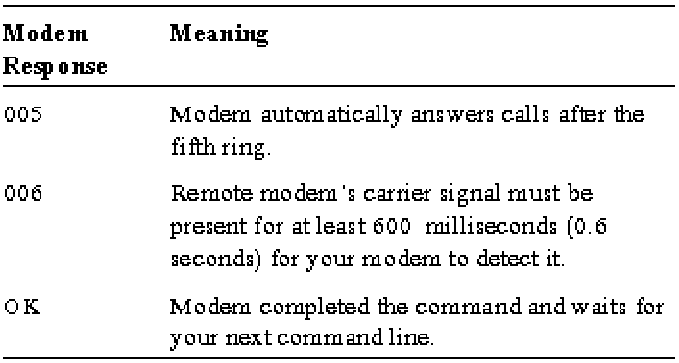
4. Press **ENTER.**

For example, to read the values of Registers **S0** (automatic answer after the number of rings specified by this register value) and **S9** (how long a remote modem's carrier signal must be present for your modem to detect it):

5. Type **AT S0? S9?** from the Command Mode.

6. Press **ENTER.**

Your modem's responses are as follows:



Modem Response	Meaning
005	Modem automatically answers calls after the fifth ring.
006	Remote modem's carrier signal must be present for at least 600 milliseconds (0.6 seconds) for your modem to detect it.
OK	Modem completed the command and waits for your next command line.

Changing a Register Value

To change a register value, use the **Sr=n** command, with:

- **r** being the register number (0-95).
- **n** being the new value you want to assign.

For example, to have your modem automatically answer incoming calls after the third ring:

1. Type **AT S0=3** from the Command Mode.

2. Press **ENTER.**

Your modem responds with **OK** to show it has executed your command and changed the register value. The value remains in effect until you turn your modem off, or reset it; your modem reverts to its default register values, or those specified in its nonvolatile memory. (In this case, Register **S0** returns to a value of 0, disabling auto answer.)

Accessing a Register Repeatedly

Your modem automatically places a pointer at the last register whose value you read or changed. The pointer facilitates your reading or changing the value of the same register. For example:

1. Type **AT S7** from the Command Mode.

2. Press **ENTER**. Your modem sets a pointer to the **S7** register automatically. You can then read the **S7** value by:

3. Typing **AT ?** from the Command Mode.

4. Pressing **ENTER.**

*You do not have to specify the **S** command or the register number; the pointer handles this for you.*

To change the value in Register **S7** to 8:

5. Type **AT S7=8** from the Command Mode.

6. Press **ENTER.**

The pointer remains set at the last register you accessed (Register **S7** in the examples above) until you use the S command to read or change the value of a different register; the pointer then moves to the register value you read or changed.

Dial Pulses and Frequencies

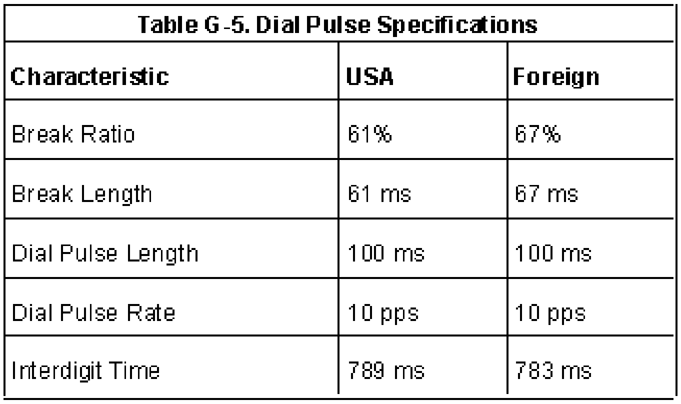


Table G-5. Dial Pulse Specifications

Characteristic	USA	Foreign
Break Ratio	61%	67%
Break Length	61 ms	67 ms
Dial Pulse Length	100 ms	100 ms
Dial Pulse Rate	10 pps	10 pps
Interdigit Time	789 ms	783 ms

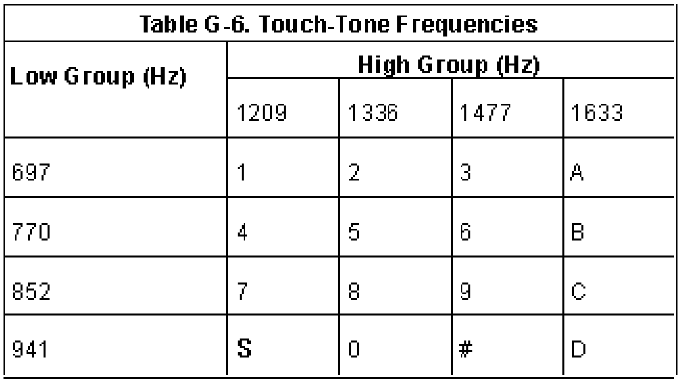


Table G-6. Touch-Tone Frequencies

Low Group (Hz)	High Group (Hz)			
	1209	1336	1477	1633
697	1	2	3	A
770	4	5	6	B
852	7	8	9	C
941	S	0	#	D

Specifications

Asynchronous Data Format	1 start bit, 7 data bits, even or odd parity, 1 stop bit 1 start bit, 7 data bits, no parity, 2 stop bits 1 start bit, 7 data bits, mark or space parity, 1 stop bit 1 start bit, 8 data bits, no parity, 1 stop bit
Dialing Capabilities	Touch-Tone and rotary-dial pulse dialing.
Command Buffer	36 or 40 characters.

Operation	Full- or half-duplex
Data Rate	Up to 300, 1200, 2400, 4800, 960 or 14400 bps
Modem	Compatible with Bell System 103 or 300 bps Compatible with synchronous/asynchronous modems Bell 212A 1200 bps synchronous/asynchronous modems CCITT V.22 1200 bps synchronous/asynchronous modems CCITT V.22bis 2400 bps synchronous/asynchronous modems CCITT V.32 9600 bps synchronous/asynchronous modems CCITT V.32bis 14400 bps synchronous/asynchronous modems V.42 LAPM and MNP 2-4 error correction. V.42bis and MNP 5 data compression
Receive Sensitivty	-43dBm.
Transmit Level	-12dBm.
Registration	FCC-registered for direct connection to the nationwide telephone system. Connects with the following modular jacks: RJ11 / RJ41S RJ45S
Typical Initialization String	AT&FE1L1V1&C1&D2S0=0S7=90
Modem Type compatibility	Hayes Ultra 14400 or Intel 14.4 EX
Test and diagnostics facilities	Local Analog Loopback L3. Local Analog Loopback L3 with Self-Test Local Digital Loopback Remote digital Loopback L2 Remote Digital Loopback L2 with Self-Test Programmable test-timer.

Responses supported (depending on system purchased)	OK	0
	CONNECT	1
	RING	2
	NO CARRIER	3
	ERROR	4
	CONNECT 1200	5
	NO DIALTONE	6
	BUSY	7
	NO ANSWER	8
	CONNECT 0600	9
	CONNECT 2400	10
	CONNECT 4800	11
	CONNECT 7200	12
	CONNECT 9600	13
	CONNECT 12000	14
	CONNECT 14400	15
DTMF tone symbols	1 2 3 4 5 6 7 8 9 # 0 * A B C D	0
Transmitter signaling frequencies	V.22 bis low-channel originate mode	1200 .01%
	V.22 low-channel originate mode	1200 ± .01%
	V.22 bis high-channel answer mode	2400 ± .01%
	V.22 high-channel answer mode	2400 ± .01%
	Bell 212A high-channel answer mode	2400 ± .01%
	Bell 212A low-channel originate mode	1200 ± .01%
	Bell 103 originate mark	1270 ± .01%
	Bell 103 originate space	1070 ± .01%
	Bell 103 answer mark	2225 ± .01%
	Bell 103 answer space	2025 ± .01%

NOTE Specifications subject to change without notice.

Fax Operation

Certain Packard Bell systems are configured with fax capability. If your system has this feature, please note the following:

The facsimile capability of the modem/fax can be accessed only with appropriate software. Please consult your fax software User's Guide for operating instructions.

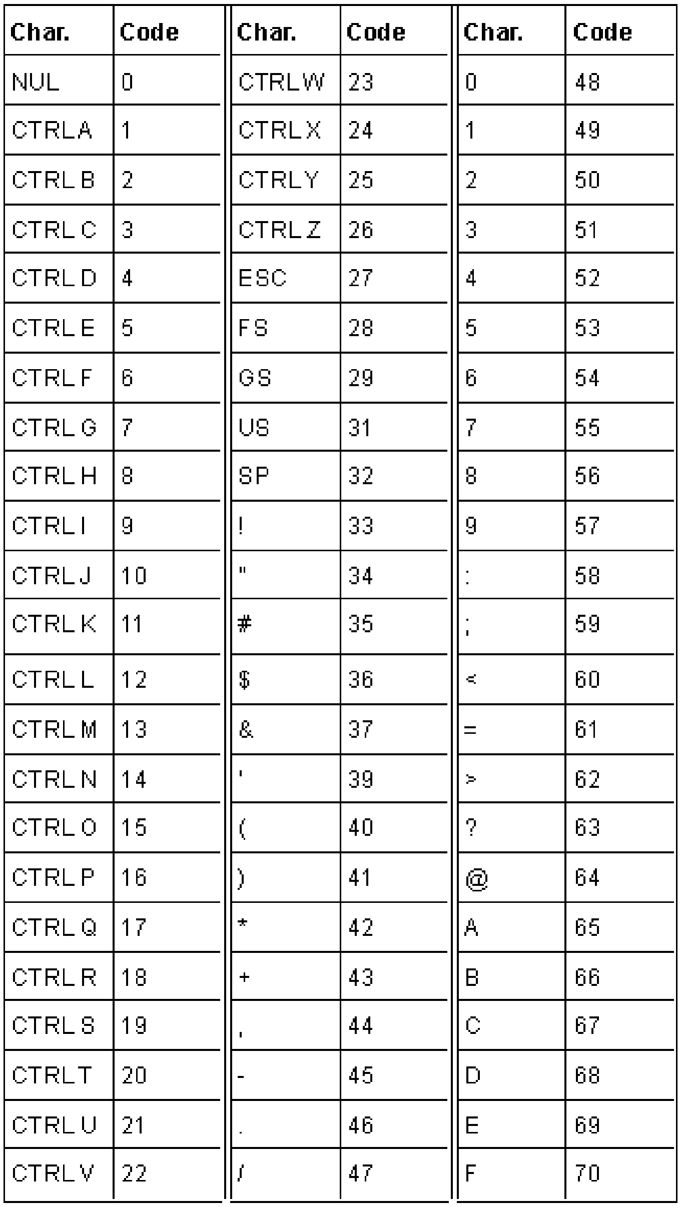
Fax Features

- Integrated data and facsimile transmission capability.
- Fax and modem software included *(see your fax software documentation for details).*
- Sophisticated send capabilities auto redial, multiple destinations, time scheduled transmission, etc.
- Send fax without having to pre-print document.
- Group III Send/Receive up to 14400bps compatible (depending on system purchased) and 4800/2400bps Auto Fallback feature.
- Departmental fax is free to receive incoming transmissions.
- Higher fax quality. Since document is not scanned, there is no loss of image quality.

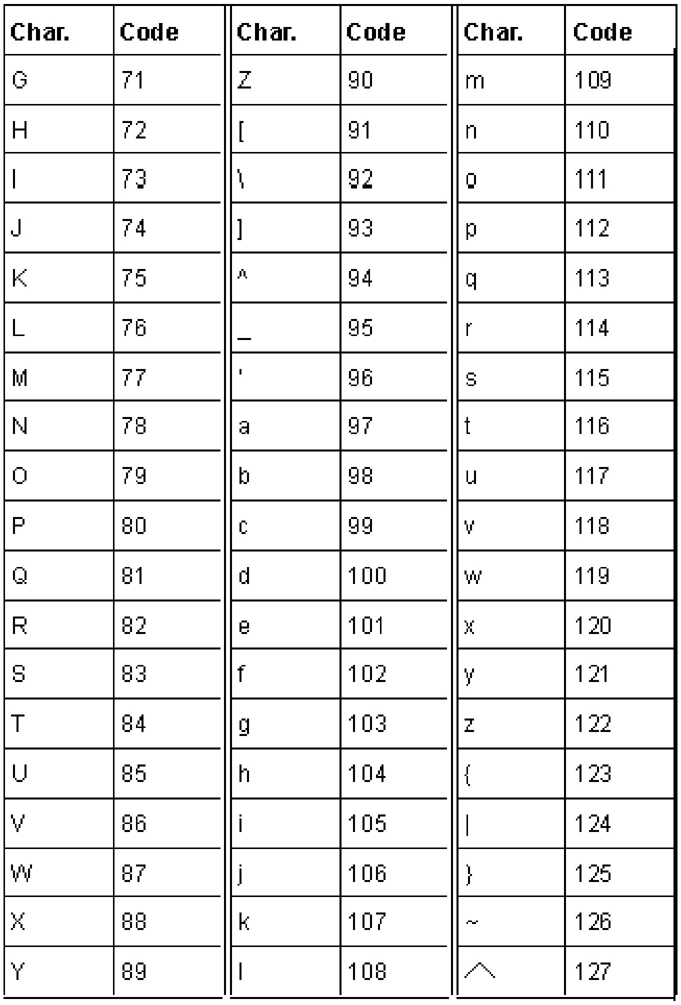
Fax Specifications

Modulation:	Send/receive rates up to 14400bps (depending on system purchased (V.17, V.29, V.27ter and V.21 channel 1)
Amplitude Phase	Shift Keying (APSK)
Compatibility:	CCITT Group III

(Specifications subject to change without notice.)



Char.	Code	Char.	Code	Char.	Code
NUL	0	CTRL W	23	0	48
CTRL A	1	CTRL X	24	1	49
CTRL B	2	CTRL Y	25	2	50
CTRL C	3	CTRL Z	26	3	51
CTRL D	4	ESC	27	4	52
CTRL E	5	FS	28	5	53
CTRL F	6	GS	29	6	54
CTRL G	7	US	31	7	55
CTRL H	8	SP	32	8	56
CTRL I	9	!	33	9	57
CTRL J	10	"	34	:	58
CTRL K	11	#	35	;	59
CTRL L	12	$	36	<	60
CTRL M	13	&	37	=	61
CTRL N	14	'	39	>	62
CTRL O	15	(	40	?	63
CTRL P	16	)	41	@	64
CTRL Q	17	*	42	A	65
CTRL R	18	+	43	B	66
CTRL S	19	,	44	C	67
CTRL T	20	-	45	D	68
CTRL U	21	.	46	E	69
CTRL V	22	/	47	F	70



Char.	Code	Char.	Code	Char.	Code
G	71	Z	90	m	109
H	72	[	91	n	110
I	73	\	92	o	111
J	74	]	93	p	112
K	75	^	94	q	113
L	76	_	95	r	114
M	77	'	96	s	115
N	78	a	97	t	116
O	79	b	98	u	117
P	80	c	99	v	118
Q	81	d	100	w	119
R	82	e	101	x	120
S	83	f	102	y	121
T	84	g	103	z	122
U	85	h	104	{	123
V	86	i	105	|	124
W	87	j	106	}	125
X	88	k	107	~	126
Y	89	l	108	⌂	127

Appendix H:
ISA Configuration Utility

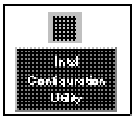
The **ISA Configuration Utility (ICU)** helps you install standard ISA cards in your computer. **You don't need to run this utility to install Plug and Play cards,** because these cards are configured automatically.

Run the utility before you insert the new ISA card. The ICU helps you to determine a working configuration that doesn't conflict with other cards in the system. You can follow the sequence of tasks in this appendix to run the utility and configure a new card.

Starting the ICU

From Windows:

Double click on the Intel Configuration Utility icon:

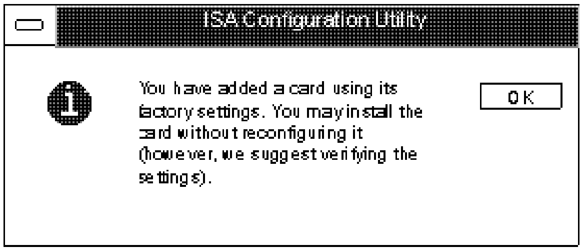


Adding a Card

1. Click on the **Add Card** button on the toolbar.
2. Select a category from the **Card Category** list box, then click **OK**.
3. Select the name of the card you are adding from the list box. If you do not see the card's name in the list, try selecting another category. If you still cannot find the name of the card you want, contact your card manufacturer for information on **Adding an Unlisted Card.**

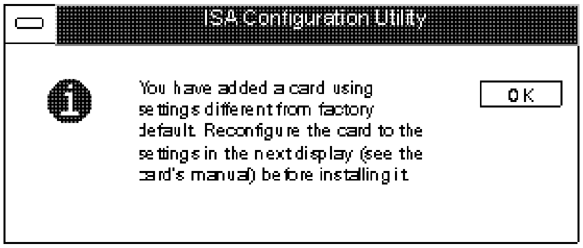
4. Click on the **OK** button. The ICU can display one of the following messages:

A. The ICU displays the following message if the ICU accepts the card as configured by the card manufacturer. Select **OK**.



You have added a card using its factory settings. You may install the card without reconfiguring it (however, we suggest verifying the settings).

B. The ICU displays the following message when the ICU selects a different configuration setting than the manufacturer's default.



You have added a card using settings different from factory default. Reconfigure the card to the settings in the next display (see the card's manual) before installing it.

Therefore, you must reconfigure your card before installing it in your system. To proceed, select **OK**. *When the ICU displays the* ***Card Resource Usage*** *dialog box with the selected card settings, make a note of this information.*

If a conflict occurs, or if you want to manually set the card's resources, contact your card manufacturer for information on **Adding A Listed Card.**

Saving/Exiting

After you have added the card:

5. Select Exit from the File menu.

6. The ICU asks whether you want to save the system configuration. Select Yes.

Reconfiguring and Installing the Card

7. Power down your system.

8. Check the jumpers/switches in your card to make sure that they match the settings you use in the ICU. See the card manufacturer's documentation for information on changing the configuration of the card. Re-jumper the card, if necessary.

9. Install the card, following the **Adapter Card** procedure in **Chapter 5: Internal Installations.**

10. Reboot your system.

If you require additional assistance, contact Packard Bell Technical Support.

Appendix I:
System Information Log

For your convenience, we have provided this System Information Log. Use it to record your computer system's components. If your system ever needs service, or if you call Packard Bell Technical Support with a question, this information will help you obtain the best possible service in the shortest time.

Main Unit			
Manufacturer:			
Address:			
Dealer:			
Address:			
Model:		Purchased: / /	
BIOS Version:*		Serial #:	
Memory Size:* Base: ☐ KB ☐ MB Extended: ☐ KB ☐ MB			
Operating System(s):			
☐ MS-DOS	Version:	☐ XENIX	Version:
☐ UNIX	Version:	☐ OS/2	Version:
☐ Other operating system (specify):			
* Displayed during system start-up			

Video Display Monitor

Manufacturer:

Address:

Purchased From:

Address:

Model: Date purchased: / /

Serial #:

Display Type: Mono ☐ Composite Color ☐ Composite Mono ☐

RGB ☐ Multi-Sync ☐ EGA ☐ VGA ☐ Full-Page ☐

Other Display Type (specify):

Video Display Monitor

Manufacturer:

Address:

Purchased From:

Address:

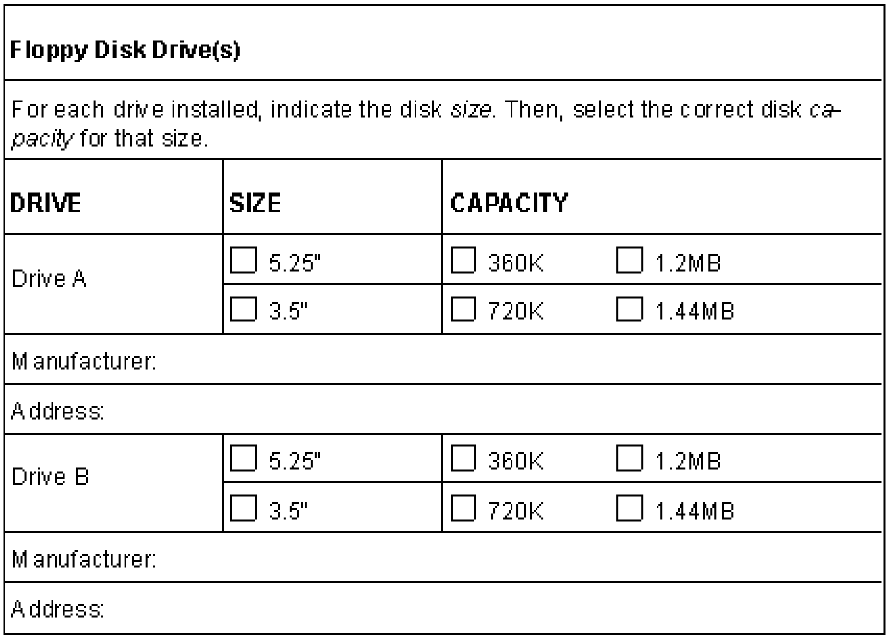
Model: Date purchased: / /

Serial #:

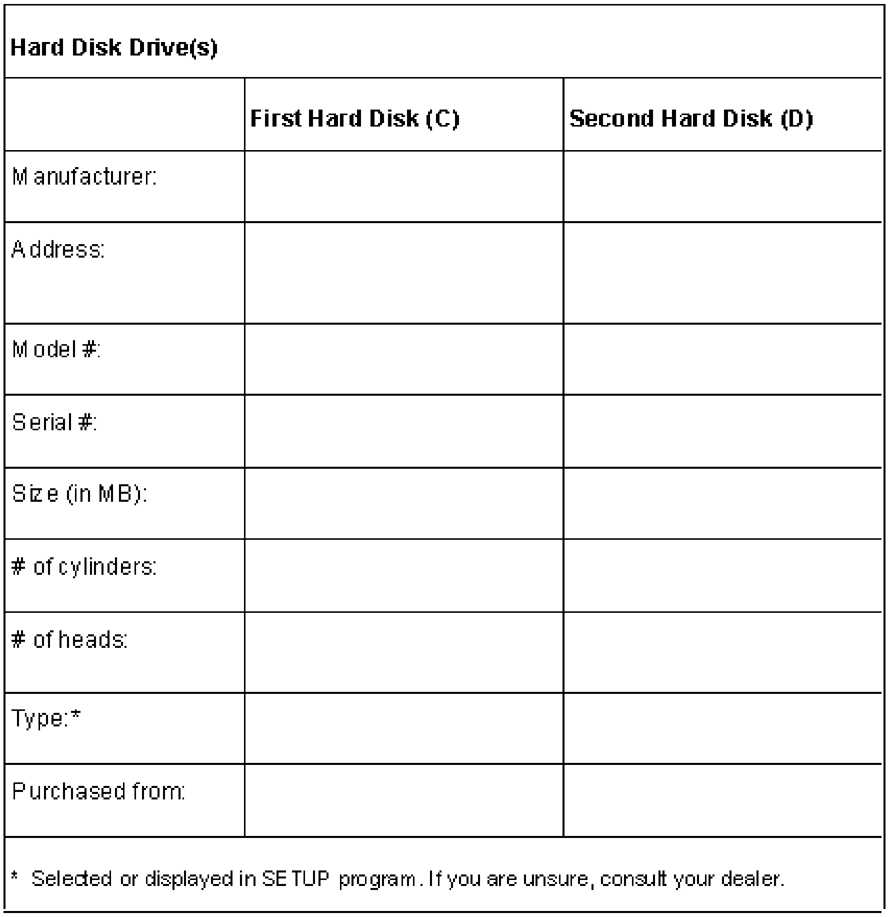
Display Type: Mono ☐ Composite Color ☐ Composite Mono ☐

RGB ☐ Multi-Sync ☐ EGA ☐ VGA ☐ Full-Page ☐

Other Display Type (specify):



Floppy Disk Drive(s)			
For each drive installed, indicate the disk *size*. Then, select the correct disk *capacity* for that size.			
DRIVE	**SIZE**	**CAPACITY**	
Drive A	☐ 5.25"	☐ 360K	☐ 1.2MB
	☐ 3.5"	☐ 720K	☐ 1.44MB
Manufacturer:			
Address:			
Drive B	☐ 5.25"	☐ 360K	☐ 1.2MB
	☐ 3.5"	☐ 720K	☐ 1.44MB
Manufacturer:			
Address:			



Hard Disk Drive(s)

	First Hard Disk (C)	Second Hard Disk (D)
Manufacturer:		
Address:		
Model #:		
Serial #:		
Size (in MB):		
# of cylinders:		
# of heads:		
Type:*		
Purchased from:		

* Selected or displayed in SETUP program. If you are unsure, consult your dealer.

Internal Modem

Manufacturer:

Address:

Model:	Purchased: / /

Serial Number:

Max. baud rate: ☐ 300 ☐ 1200 ☐ 2400 ☐ 9600 ☐ ______

Uses port: ☐ COM1 ☐ COM2 ☐ COM3 ☐ COM4

IRQ jumper setting:

Other circuit board/adapter card	
Manufacturer:	
Address:	
Model:	Purchased: / /
Please note the function and significant features of the card below:	